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COAST FISHES  
PART I. THE SOUTH ATLANTIC

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# COAST FISHES

## PART I. THE SOUTH ATLANTIC<sup>1</sup>

(INCLUDING THE CAPE VERDE ISLANDS, WEST AFRICA, SOUTH AFRICA,  
ASCENSION ISLAND, TRISTAN DA CUNHA AND GOUGH ISLAND)

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(Text-figs. 1-15.)

### INTRODUCTION

THE collection of coast fishes<sup>2</sup> obtained by the R.R.S. 'Discovery' and the R.R.S. 'William Scoresby' is so large that it has proved necessary to divide the report on these fishes into three sections, of which the present one is the first. The second part

<sup>1</sup> A certain number of fishes were also obtained by the expedition in New Zealand. Of these, some were collected by the R.R.S. 'Discovery II'; others were presented by the N.Z. Fisheries, Ltd., Wellington, and were selected from specimens in the fish market; and a small series of freshwater fishes was obtained through the courtesy of the New Zealand Marine Department. These New Zealand fishes will form a very valuable addition to the collections of the British Museum, but it has not seemed necessary to deal with them in detail here. A list of the species represented is given below, and references to nearly all these are to be found in the check-list of New Zealand fishes published by Phillipps in 1927 (*N.Z. Marine Dept., Fisheries Bull.*, No. 1).

*Geotria australis*, Gray

*Eptatretus cirrhatus* (Schn.)

*Mustelus manazo*, Bleek. ?

*Raja nasuta*, Müll. and Henle

*Trygon breviceaudata*, Hutton

*Argentina elongata*, Hutton

*Retropinna retropinna* (Richardson)

*Galaxias fasciatus*, Gray

*Galaxias attenuatus* (Jenyns)

*Prototroctes oxyrhynchus*, Günth.

*Gonorhynchus gonorrhynchus* (Linn.)

*Chlorophthalmus nigripinnis*, Günth.

*Conger conger* (Linn.)

*Ariosoma habenata* (Richardson)

*Macruronus novae-zeelandiae* (Hector)

*Physiculus bachus* (Schn.)

*Hoplopteryx affinis* (Günth.)

*Zeus faber*, Linn.

*Polyprion oxygeneios* (Schn.)

*Caesioperca lepidoptera* (Schn.)

*Usacaranx lutescens* (Richardson)

*Trachurus novae-zeelandiae*, Richardson

*Dactylopagrus macropterus* (Schn.)

*Parapercis colias* (Schn.)

*Hemerocoetes pauciradiatus*, Regan

*Thyrsites atun* (Euphrasen)

*Gobiomorphus gobioides* (Cuv. and Val.)

*Favonigobius lateralis* (Macleay)

*Tripterygion varium* (Schn.)

*Helcogramma medium* (Günth.)

*Genypterus blacodes* (Schn.)

*Agonostomus forsteri* (Schn.)

*Serirolella brama* (Günth.)

*Pterygotrigla picta* (Günth.)

*Chelidonichthys kumu* (Lesson and Garnot)

*Lepidotrigla brachyoptera*, Hutton

*Lophonectes gallus*, Günth.

*Pelotretis flavilatus*, Waite

*Peltorhamphus novae-zeelandiae*, Günth.

*Rhombosolea retiaris*, Hutton

*Rhombosolea leporina*, Günth.

*Meuschenia convexirostris* (Günth.)

<sup>2</sup> The term "coast fishes" was suggested by Regan (1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool., 1, p. 24) to include not only the littoral forms but also fishes that may occur at no great distance from the coasts in water down to two or three hundred fathoms deep, and are not pelagic or bathypelagic. The true oceanic fishes have been dealt with in a previous report (Norman, 1930, *Discovery Reports*, 11, pp. 261-370, pl. ii, 47 text-figs.).

will include the important collections made during the trawling survey of the Magellan-Falkland Islands region, and will also deal with the fishes of the coast of Chile. The fishes of South Georgia, the South Orkneys, the South Shetlands, and those of the Antarctic Continent, will form the subject of the last section of the report.

On her first commission the 'Discovery' made brief calls at Ascension and Tristan da Cunha on her way to the south, and a few fishes were obtained at both these islands. In July 1927 she called at the Cape, and while the ship was in dock at Simon's Town Mr E. R. Gunther and Mr F. C. Fraser were able to make a trip lasting about five days in one of the South African commercial trawlers (S.T. 'Richard Bennet') and to preserve a valuable collection of deep-water fishes obtained with the trawl. On the homeward voyage in 1927 the 'Discovery' made several hauls off the coasts of Angola and French Congo, and off Annobon, obtaining a very interesting series of fishes, several of which have proved to be new to science. After leaving the Gulf of Guinea a call was made at the Cape Verde Islands, where a few fish were collected. In June 1927 the 'William Scoresby' was at Gough Island, and one or two fishes were obtained from here.

All the text-figures accompanying this report are the work of Lieut.-Col. W. P. C. Tenison, D.S.O., who has prepared the drawings with his customary care and skill.

The author takes this opportunity of expressing his sincere thanks to the members of the Discovery Committee for permission to study these collections and to undertake the preparation of this report.

## CAPE VERDE ISLANDS

Examples of only five species were collected here, but three of these are of particular interest.

### BELONIDAE

*Belone ardeola* (Cuv. and Val.).

*Belone ardeola*, Cuvier and Valenciennes, 1846, *Hist. Nat. Poiss.*, xviii, p. 425.

*Belone trachura*, Cuvier and Valenciennes, 1846, *t.c.*, p. 456; Troschel, 1866, *Arch. Naturgesch.*, xxxii (1), p. 234; Günther, 1866, *Cat. Fish.*, vi, p. 235; Fowler, 1919, *Proc. U.S. Nat. Mus.*, lvi, pp. 196, 217, fig. 1.

? *Belone depressa*, Poey, 1856-8, *Mem. H.N. Cuba*, ii, p. 296.

*Belone depressa*, Günther, 1866, *t.c.*, p. 235.

*Belone lovii*, Günther, 1866, *t.c.*, p. 236.

*Tylosurus ardeola*, Jordan and Evermann, 1896, *Bull. U.S. Nat. Mus.*, xlvii (1), p. 713; Evermann and Marsh, 1902, *Bull. U.S. Fish. Comm.*, xx (1900), p. 99.

*Belone (Tylosurus) ardeola*, Metzelaar, 1919, *Trop. Atlant. Vissch.*, pp. 29, 218.

*Strongylura ardeola*, Nichols and Breder, 1928, *Zoologica, N.Y.*, viii, p. 423; Breder, 1932, *Carnegie Inst. Washington, Publ.* 435, p. 7, figs.

? *Strongylura longleyi*, Breder, 1932, *t.c.*, p. 12, pl. ix, text-figs.

St Vincent. 2. ix. 27. Hand line: 2 specimens, 360, 370 mm.

Length of head (to tip of upper jaw)  $2\frac{3}{4}$  to nearly  $3\frac{1}{4}$  in that of fish (without caudal). Diameter of eye rather more than interorbital width and  $1\frac{1}{2}$  to 2 in postorbital part of



head. 7 to 9 gill-rakers on lower part of anterior arch. 110 to 130 scales from occiput to origin of dorsal fin. Dorsal 13-17. Anal 18-21. Origin of pectoral usually nearer to last ray of anal than to head, sometimes equidistant from them. Caudal peduncle strongly depressed.

*Hab.* West Indies; Azores; Cape Verde Islands; Tropical West Africa; St Helena; Ascension.

The presence of gill-rakers and the comparatively slender jaws place this species in the genus *Belone*, Cuv.<sup>1</sup> On comparing three examples from the Cape Verde Islands, including the type of *B. lovii*, Günther, with six from the West Indies (*B. depressa*, Günther), I am unable to find any essential differences, and there is little doubt that the same species is to be found on both sides of the Atlantic. I have followed American authors in identifying this species with *B. ardeola* of Cuvier and Valenciennes, originally described from Martinique, but a re-examination of the types of this and other species of Gar-fishes described by the French authors is badly needed. The form recently described by Breder as *Strongylura longleyi* is said to differ from *Belone ardeola* only in the longer head, of which the depth is less than the width, and the somewhat larger eye. Of the West Indian specimens examined by me some appear to be referable to Breder's species, but I am of the opinion that the study of a large series of specimens would reveal this to be, at the most, a subspecies of *B. ardeola*. I have also examined twelve examples of *B. trachura* from Ascension and St Helena, and find that these differ from both West Indian and Cape Verde Islands specimens of *B. ardeola* only in the slightly higher number of dorsal and anal rays and perhaps in the larger number of predorsal scales. The eye is a little smaller than that of the Cape Verde Islands specimens, but agrees very well with some of the West Indian examples. On the whole, I think it best to recognize two subspecies: *B. ardeola ardeola* from the West Indies, Azores and Cape Verde Islands;<sup>2</sup> and *B. ardeola trachura* from Ascension and St Helena. The measurements of head and eye, and the fin-ray and scale counts, are shown in the accompanying table.

	West Indies (6)	Cape Verde Islands (3)	Ascension and St Helena (12)
Head in length of fish	$2\frac{3}{4}$ to 3	$2\frac{1}{5}$ to $3\frac{1}{5}$	$2\frac{1}{5}$ to $3\frac{1}{4}$
Eye in postorbital part of head	$1\frac{3}{5}$ to 2 ( $2\frac{1}{10}$ )	$1\frac{1}{2}$ to $1\frac{2}{3}$ (2)	( $1\frac{3}{5}$ ) $1\frac{2}{3}$ to 2
Number of predorsal scales	112-114 (130)	110-112 (129)	(110) 120-130
Number of dorsal rays	(12) 13-14 (15)	13-14	(14) 15-17
Number of anal rays	(16) 18-19	18 (19)	19-21

<sup>1</sup> See Regan, 1911, *Ann. Mag. Nat. Hist.* (8) VII, p. 332.

<sup>2</sup> Examples presumably belonging to this subspecies have been recorded from Senegambia (Rochebrune) and St Thomé (Osorio).

## CARANGIDAE

*Decapterus punctatus* (Cuv.).

Norman, 1935, *Ann. Mag. Nat. Hist.* (10) xvi, p. 254.

St Vincent. 2. ix. 27. Hand line: 1 specimen, 222 mm.

*Hab.* Atlantic coast of America, from Cape Cod to Brazil, occasionally farther north; Cape Verde Islands; Tropical West Africa.

## POMACENTRIDAE

*Glyphisodon hermani*, Steind.

*Glyphidodon (Parma) hermani*, Steindachner, 1888, *SitzBer. Akad. Wiss. Wien*, xcvi (1), (1887), p. 59, pl. iii.

St Vincent. 2. ix. 27. Hand line: 1 specimen, 205 mm.

This species is new to the British Museum collection. I have nothing to add to Steindachner's excellent description and figure.

## SCORPAENIDAE

*Scorpaena laevis*, Troschel.<sup>1</sup>

1866, *Arch. Naturgesch.*, xxxii (1), p. 206.

St Vincent. 2. ix. 27. Hand line: 1 specimen, 175 mm.

Depth of body 3 in the length, length of head  $2\frac{1}{4}$ . Depth of head at origin of dorsal fin  $1\frac{1}{4}$  to  $1\frac{1}{3}$  in its length. Snout about as long as eye, diameter of which is  $4\frac{3}{4}$  to 5 in length of head and equal to or a little greater than interorbital width. Scales on cheek and on opercular region, but no obvious pores. A deep occipital pit. Praeorbital spines strong, the anterior with a secondary spine at its base; 3 well-developed spines on suborbital ridge. Supraorbital tentacle absent in the smaller specimen, little larger than the tentacle above the anterior edge of the eye and about  $\frac{1}{3}$  diameter of eye in the larger; a number of other membranous processes on head in the larger specimen. Length of palatine band of teeth about  $\frac{1}{2}$  diameter of eye. 9 gill-rakers on lower part of anterior arch. Scales cycloid; about 37 to 40 in a longitudinal series above lateral line, 4 or 5 between last soft-ray of dorsal and lateral line; breast scaled; a number of membranous processes scattered over body, especially on the back and in the region of the lateral line. Dorsal XI–XII 9; third and fourth spines longest,  $2\frac{1}{3}$  to  $2\frac{1}{2}$  in length of head. Anal III 5; second spine stronger and a little longer than third. Pectoral with 19 rays, extending to above vent or a little beyond, its length<sup>2</sup>  $1\frac{1}{2}$  to  $1\frac{3}{5}$  in that of head; base broad, the lowermost ray inserted level with the root of the pelvic spine and well in advance of uppermost. Greyish brown, with irregular darker markings, of which those on the fins tend to form bars; inner surface of pectoral with large dark brown or black spots, those near the base of the fin uniting to form cross-bars.

*Hab.* Cape Verde Islands.

In addition to the small specimen collected by the Discovery Expedition, there is a much larger one in the collection of the British Museum, 295 mm. in total length,

<sup>1</sup> See also p. 30 of this report.

<sup>2</sup> Measured from upper angle.

which has been included in the above description. This species is very close to *S. senegalensis*, Steindachner,<sup>1</sup> of which I have examined a single specimen from the Gold Coast, 280 mm. in total length. The Cape Verde species appears to have a shorter, deeper head, with a somewhat shorter snout, and the spines on the head are generally stouter and less acute. The supraorbital tentacle is smaller and less branched, the pectoral fin is a little shorter, and there are minor differences in the coloration. Fowler<sup>2</sup> has given a detailed description of a specimen, 295 mm. in length, from the Cape Verde Islands, identified by him as *S. senegalensis*, but it seems probable that his fish is referable to *S. laevis*. Both species are readily distinguished from *S. porcus*, Linn., *S. scrofa*, Linn., and *S. ustulata*, Lowe, by the smooth scales, scaly breast, and other

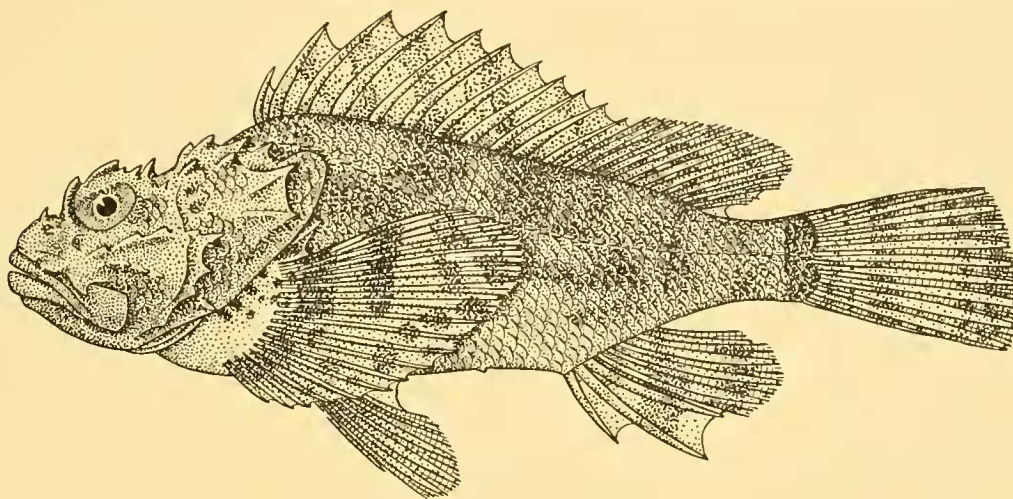


Fig. 1. *Scorpaena laevis*.  $\times \frac{3}{4}$ .

characters. *S. plumieri*, Bloch, from the Atlantic coast of tropical America, is closely related to *S. laevis* and *S. senegalensis*, but has the axil of the pectoral fin jet black with a few pure white spots, and there are other differences in coloration. Further, the eye is somewhat smaller and the spinous dorsal fin lower.

#### DACTYLOPTERIDAE

*Dactylopterus volitans* (Linn.).

St Vincent. 2. ix. 27. Hand line: 1 specimen, 300 mm.

#### WEST AFRICA

Fishes were obtained from five stations, three off the coast of Angola, one off the French Congo, and one off Annobon, Gulf of Guinea. None of the specimens are from a depth of more than 100 m. Altogether nearly 300 specimens were collected from these stations, representing about 50 species, of which 9 have proved to be new to science.

<sup>1</sup> 1881, *Denkschr. Akad. Wiss. Wien*, XLIV, p. 31, pl. iv.

<sup>2</sup> 1919, *Proc. U.S. Nat. Mus.*, LVI, p. 214.



## CARCHARINIDAE

*Mustelus laevis*, Risso.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64-65 m.: 1 male specimen, 700 mm.

## SQUATINIDAE

*Squatina oculata*, Bonaparte.

1840, *Icon. Faune Ital.* (28), fig.; Lozano Rey, 1928, *Fauna Ibérica, Peces*, p. 494, pl. vii.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 2 male specimens, 380, 560 mm.

These specimens clearly belong to this Mediterranean species, which is also found on the southern and eastern coasts of Spain and has been beautifully figured by Lozano Rey in his monograph of the Selachians of Spain. *S. fimbriata*, Müller and Henle, of the Mediterranean, has been regarded as synonymous with *S. oculata*, but there can be little doubt that it is identical with *S. aculeata*, Cuvier. Regan<sup>1</sup> recorded a large specimen of *Squatina* from Lagos as *S. africana*, Regan, a Natal species, but a re-examination of this specimen shows that it belongs to *S. oculata*. The two species are very closely related, but *S. oculata* has smaller spiracles than *S. africana*, with fringed anterior margins, the lobes of the caudal fin more acutely pointed, and the dorsal fins narrower and more acute. There are also differences in the coloration. The large example recorded by Metzelaar<sup>2</sup> from Goree is clearly referable to *S. oculata*. The following represents a synopsis of the European and African species of *Squatina*:

- I. A mid-dorsal series of enlarged denticles in the adult, forming a row of sharp spines along the back ... .. *aculeata*, Cuv. [= *fimbriata*, M. and H.]
- II. No mid-dorsal series of enlarged denticles in the adult.
  - A. Dermal denticles not carinate, a large patch on lower surface between pectoral fins; distance from anterior angle to posterior end of base of pectoral  $\frac{1}{2}$  or nearly  $\frac{1}{2}$  the extreme length of the fin ... .. *squatina*, Linn. [= *angelus*, Dum.]
  - B. Dermal denticles 3-7 carinate, none on lower surface between pectoral fins; distance from anterior angle to posterior end of base of pectoral a little more than  $\frac{1}{3}$  the extreme length of the fin.
    1. Width of spiracle equal to or less than diameter of eye, its anterior margin fringed; lobes of caudal fin (in adult) more or less acutely pointed ... .. *oculata*, Bonap.
    2. Width of spiracle greater than diameter of eye, its anterior margin not fringed; lobes of caudal fin (in adult) more obtusely pointed ... .. *africana*, Regan

## TORPEDINIDAE

*Torpedo torpedo* (Linn.).

*Torpedo narce*, Günther, 1870, *Cat. Fish.*, viii, p. 449; Pellegrin, 1914, *Ann. Inst. océanogr. Monaco*, vi (4), p. 8.

*Narcacion torpedo*, Garman, 1913, *Mem. Mus. Comp. Zool.*, xxxvi, p. 306.

*Torpedo torpedo*, Lozano Rey, 1928, *Fauna Ibérica, Peces*, p. 518, pl. ix, fig. 1.

<sup>1</sup> 1915, *Ann. Mag. Nat. Hist.* (8) xv, p. 124.

<sup>2</sup> 1919, *Trop. Atlant. Vissch.*, p. 191.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 4 specimens, 180–260 mm.

*Hab.* Mediterranean and neighbouring parts of the Atlantic.

### RAJIDAE

*Raja miraletus*, Linn.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 2 male specimens, 435, 440 mm.

*Raja* sp.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73–91 m.: one empty egg-capsule.

### SYNODONTIDAE

*Saurida parri*, Norman.

1935, *Proc. Zool. Soc.*, p. 126, fig. 15.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 2 specimens, 37, 115 mm.<sup>1</sup>

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 12 specimens, 80–125 mm.

*Hab.* Off the coasts of Angola and French Congo.

### MURAENIDAE

*Muraena unicolor* (Delaroche).

St. 271. 30. vii. 27. Off Elephant Bay, Angola. Shore collection: 1 specimen, 355 mm.

This fish is in rather poor condition, but appears to belong to this species.

*Muraena* sp.

St. 283. 14. viii. 27. Off Annobon, Gulf of Guinea. Large dredge, 18–30 m.: 14 specimens, 40–120 mm.

### GADIDAE

*Bregmaceros maclellandi*, Thompson.

Norman, 1930, *Discovery Reports*, 11, p. 339.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 1 specimen, 51 mm.

### ZEIDAE

*Zeus faber*, Linn.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73–91 m.: 3 specimens, 240–290 mm.

### SERRANIDAE

*Epinephelus goreensis* (Cuv. and Val.).

St. 271. 30. vii. 27. Elephant Bay, Angola. Hand line, 18 m.: 2 specimens, 265, 345 mm.

*Epinephelus aeneus* (Geoffr.).

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73–91 m.: 1 specimen, 600 mm.

<sup>1</sup> The larger of these is the holotype.

*Neanthias accraensis*, Norman.

1931, *Ann. Mag. Nat. Hist.* (10) VII, p. 354, fig. 2.

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58-67 m.: 1 specimen, 130 mm.

This species was known previously only from the Gold Coast. In life the belly is said to be silvery and the upper part of the body darker. The head is ornamented with 3 or 4 broad oblique yellow bands. The median fins are mottled with yellow, and the soft dorsal is fringed with red.

*Rhegma guineensis*, sp.n.

St. 283. 13. viii. 27. Off Annobon, Gulf of Guinea. Large dredge, 18-20 m.: 1 specimen, 29 mm.

Very close to *R. thaumasium*, Gilbert, from the Pacific coast of Panama, but without supraocular tentacles. Depth of body about  $3\frac{1}{3}$  in the length, length of head  $2\frac{1}{2}$ . Snout shorter than eye, diameter of which is 4 in length of head and more than twice the

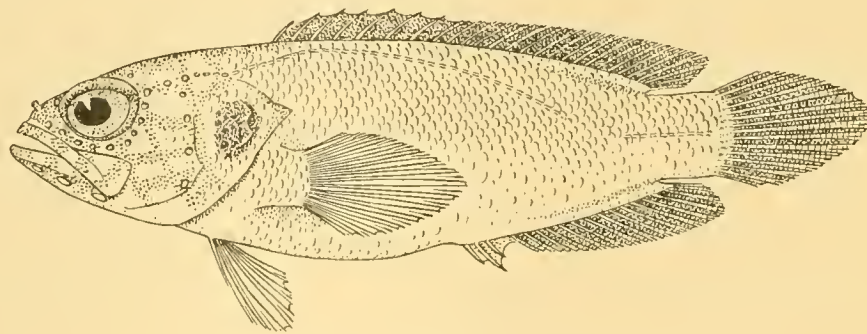


Fig. 2. *Rhegma guineensis*.<sup>1</sup> Holotype.  $\times 4$ .

interorbital width. Maxillary extending to a very little beyond posterior margin of eye; lower jaw a little projecting; no distinct canine teeth in jaws, but some of the anterior teeth apparently somewhat enlarged. A single broad spine on the preoperculum; two broad, flat spines embedded in the operculum. About 5 gill-rakers on lower part of anterior arch. 48 (?) scales in lateral line. Dorsal VII 20. Anal III 16 or 17. Pectoral extending nearly to above first anal spine, a little shorter than head. Brownish above, rather paler below; a round dark spot, a little smaller than the eye, on the operculum; sides of head with traces of two dark lines; dorsal, anal and caudal fins blackish; other fins paler.

One other species of this genus has been described, namely *Caribrhegma gregoryi*, Breder, from the Glover Reef off the coast of British Honduras. In this species supraocular tentacles are present, and the dorsal has 15 soft-rays, the anal 12. The two flat spines on the operculum said to be characteristic of *Caribrhegma* are to be found also in *Rhegma thaumasium*, and the other differences mentioned by Breder seem to be only of specific importance.

<sup>1</sup> The course of the lateral line shown in the figure is doubtful, as most of the scales are missing in this region.



## CHILODIPTERIDAE

Genus *Synagrops*, Günther

*Melanostoma* (*non* Schiner), Steindachner and Döderlein, 1884. Type *M. japonicum*, Steind. and Döderl.

*Synagrops*, Günther, 1887. Type *Melanostoma japonicum*, Steind. and Döderl.

*Parascombrops*, Alcock, 1889. Type *P. pellucidus*, Alcock.

*Hypoclydonia*, Goode and Bean, 1895. Type *H. bella*, Goode and Bean.

*Maccullochina*, Jordan, 1922. Type *Synagrops serratospinosa*, Smith and Radcliffe.

Key to the species<sup>1</sup>I. Fin-spines all without serrae. [*SYNAGROPS*.]

A. About 30 scales in lateral line; depth  $3\frac{3}{4}$  to more than 4 in length; eye 3 to  $3\frac{1}{3}$  in head; anal II 7.

1. Maxillary to below centre of eye,  $2\frac{1}{4}$  to  $2\frac{1}{3}$  in head ... .. *bellus* (Goode and Bean)

2. Maxillary to below anterior margin of pupil,  $2\frac{1}{2}$  in head *japonicus* (Steind. and Döderl.)

B. About 40 scales in lateral line; depth  $3\frac{1}{3}$  to  $3\frac{1}{2}$  in length; eye  $3\frac{1}{3}$  to  $3\frac{3}{4}$  in head; anal II 9

*microlepis*, sp.n.

## II. Spines of pelvics and sometimes anterior spines of dorsal and anal with serrae on outer edges.

[*PARASCOMBROPS*.]

A. Only pelvic spines with serrae; snout nearly as long as eye; depth  $3\frac{3}{4}$  to 4 in length

*philippinensis* (Günth.)

B. Anterior spines of dorsal and anal as well as spines of pelvics with serrae; snout much

shorter than eye; depth 3 to  $3\frac{1}{8}$  in length ... .. *serratospinosus*, Smith and Radcl.

Through the courtesy of the United States National Museum, I have been able to examine an authentic specimen of *S. japonicus* from Suruga Bay ('Albatross', No. 51434, 100 mm.). I have also seen 4 specimens of *S. bellus* from the Dry Tortugas, Florida, received through the kindness of Dr W. H. Longley, and have included a redescription of that species here. *S. japonicus* and the two species of the subgenus *Parascombrops* have recently been redescribed by Fowler,<sup>2</sup> and full synonymies will be found in his paper.

*Synagrops bellus* (Goode and Bean).

*Hypoclydonia bella*, Goode and Bean, 1895, *Ocean. Ichth.*, p. 236, fig. 237; Jordan and Evermann, 1896, *Bull. U.S. Nat. Mus.*, XLVII (1), p. 1115, fig. 475.

Depth of body  $3\frac{3}{4}$  to  $3\frac{4}{5}$  in the length, length of head about 3. Snout a little more than  $\frac{1}{2}$  as long as eye, diameter of which is 3 to  $3\frac{1}{3}$  in length of head and a little greater than interorbital width. Maxillary extending to below middle of eye, length  $2\frac{1}{4}$  to  $2\frac{1}{3}$  in that of head; lower jaw projecting. Upper jaw with broad bands of minute villiform teeth, which are separated at the symphysis, and with a pair of strong, slightly curved canine teeth anteriorly. Lower jaw with a marked concavity anteriorly on each side of the symphysis; anterior part of jaw with bands of minute villiform teeth, and with a

<sup>1</sup> *Synagrops natalensis*, Gilchrist, from Natal, has been very briefly described, but is probably identical with *S. japonicus*.

<sup>2</sup> 1930, *Bull. U.S. Nat. Mus.*, c (10), p. 136.

pair of symphysial canines of moderate size; sides of each mandible with 4 to 6 strong canines, of which the two hindmost are largest and about as large as those of the upper jaw; some minute teeth between and posterior to the lateral canines; a triangular patch of villiform teeth on the vomer and a band of similar teeth, tapering behind, on each palatine. Praeoperculum finely serrated along hinder and lower edge; upper part of operculum with two feeble, flat spines. Gill-rakers of moderate length and rather stout; 13 to 15 on lower part of anterior arch. Scales thin, cycloid; 29 (?) in a longitudinal series; lateral line high up on body, with a gradual curve which nearly follows the outline of the back. Dorsal IX, I 9; interspace between the two fins  $\frac{2}{5}$  to  $\frac{2}{3}$  diameter of eye. Anal II 7; first spine about  $\frac{1}{3}$  as long as second, which is 4 to  $4\frac{2}{3}$  in length of head. Pectoral with 16 or 17 rays, length  $\frac{2}{3}$  to  $\frac{3}{4}$  that of head. Pelvic I 5; spine without serrae; origin a little in advance of pectoral base. Caudal forked; caudal peduncle about  $2\frac{1}{4}$  times as long as deep. A black blotch on upper part of spinous dorsal fin.

*Hab.* Atlantic coast of tropical America, in deep water.

Described from 4 specimens, 90–133 mm. in total length, from the Dry Tortugas, Florida.

This species proves to be very close to *S. japonicus*, but appears to have a somewhat larger mouth. It is possible that the two species will eventually have to be united.

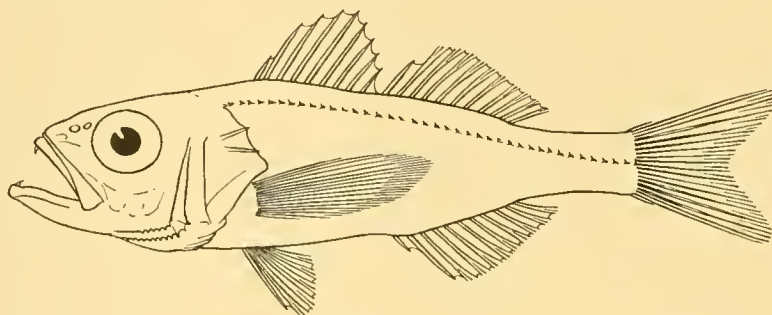


Fig. 3. *Synagrops microlepis*. Holotype.  $\times 2$ .

*Synagrops microlepis*, sp.n.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 13 specimens, 33–60 mm. (holotype, 50 mm.)

Closely related to the preceding species. Depth of body  $3\frac{1}{3}$  to  $3\frac{1}{2}$  in the length, length of head  $2\frac{1}{3}$  to  $2\frac{2}{5}$ . Snout about  $\frac{4}{5}$  as long as eye, diameter of which is  $3\frac{1}{3}$  to  $3\frac{3}{4}$  in length of head and very little greater than interorbital width. Maxillary scarcely extending to below middle of eye, length about  $2\frac{1}{2}$  in that of head; lower jaw strongly projecting; concavity in the mandible very shallow. Upper jaw with bands of minute villiform teeth, separated at the symphysis by a rather broad interspace, on either side of which are one or two strong, curved canines, sometimes depressible; lower jaw anteriorly with bands of villiform teeth and with one or two pairs of small symphysial canines, laterally with 3 or 4 curved canine-like teeth on each side, continued posteriorly by a short narrow band of minute teeth; a V-shaped patch of small teeth on the vomer and a narrow band of similar teeth on each palatine. Praeoperculum with denticulations

along the lower margin and on lower part of hinder edge; a few denticulations at angle of preopercular ridge; upper part of operculum with two divergent ridges, terminating posteriorly in thin, flat spines. Gill-rakers slender, of moderate length; 13 or 14 on lower part of anterior arch. Scales cycloid; about 40 in lateral line. Dorsal IX, I 10; the two fins nearly contiguous; fifth spine longest, length  $2\frac{1}{3}$  to  $2\frac{1}{2}$  in that of head. Anal II 9; first spine very short, second  $2\frac{3}{4}$  to  $3\frac{1}{2}$  in length of head. Pectoral with 16 or 17 rays; extending to above origin of anal or beyond, length  $\frac{3}{4}$  to  $\frac{4}{5}$  that of head. Pelvic I 5; spine without serrae; origin below or very little in advance of pectoral base. Caudal peduncle about twice as long as deep. Brownish, with a number of minute dark dots on back and upper parts of sides, which tend to form a dark band on either side of base of dorsal fin, the two bands uniting behind to form a dark patch on upper surface of caudal peduncle; a narrow dark line on either side of base of anal fin and a narrow dark vertical bar at base of caudal; lateral line dusky; dorsal and caudal fins with small dark dots; an indistinct blackish area on distal part of spinous dorsal; other fins pale.

### LATILIDAE

*Latilus semifasciatus*, Norman.

1931, *Ann. Mag. Nat. Hist.* (10) VII, 356, fig. 3.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73–91 m.: 1 specimen, 215 mm.

This species was known previously only from the holotype, 300 mm. in length, from the Gold Coast. In life there is said to be a “lustrous blue” shade along back at base of dorsal fin. Yellow is present in the neighbourhood of the mouth and orbit.

### POMADASIDAE

*Pomadasys jubelini* (Cuv. and Val.).

*Pristipoma jubelini*, Steindachner, 1870, *SitzBer. Akad. Wiss. Wien*, LX (1), p. 675, pl. ii.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 4 specimens, 295–345 mm.

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 12 specimens, 35–80 mm.

*Hab.* Tropical West Africa.

### SCIAENIDAE

*Otolithus macrognathus* (Bleeker).

Steindachner, 1870, *SitzBer. Akad. Wiss. Wien*, LX (1), p. 690, pl. vii.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 2 specimens, 445, 520 mm.

*Hab.* Tropical West Africa.

*Otolithus senegalensis*, Cuv. and Val.

Steindachner, 1870, *t.c.*, p. 687, pl. vi.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 1 specimen, 395 mm.

*Hab.* Tropical West Africa.



*Sciaena aquila* (Lacep.).[? *Sciaena hololepidota* (Lacep.).]

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64-65 m.: 3 specimens, 275-295 mm.

*Sciaena angolensis*, sp.n.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64-65 m.: 4 specimens, 240-260 mm. (holotype, 240 mm.).

Depth of body  $3\frac{3}{5}$  to  $3\frac{3}{4}$  in the length, length of head about 3. Snout shorter than eye, diameter of which is  $3\frac{2}{3}$  to  $3\frac{3}{4}$  in length of head and about  $1\frac{1}{3}$  times interorbital width. Snout obtuse and rounded; jaws equal anteriorly; maxillary extending to below middle of eye or a little beyond; 2 pairs of open pores beneath the lower jaw; teeth in villiform bands anteriorly, tapering laterally to a single series; those of outer row in upper jaw

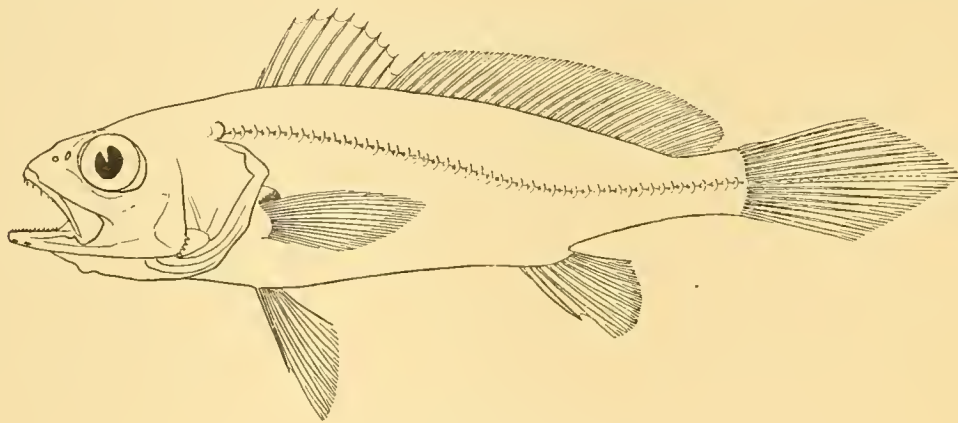


Fig. 4. *Sciaena angolensis*. Holotype.  $\times \frac{1}{2}$ .

enlarged, becoming canine-like anteriorly; those of inner row of lower jaw moderately enlarged. Margin of preoperculum with some minute denticulations along posterior edge; angle rounded, with some larger and more distinct teeth; operculum with two weak, flat spines. 9 or 10 gill-rakers of moderate length on lower part of anterior arch. Scales finely ciliated; 47 to 49 in lateral line, 5 or 6 from origin of dorsal to lateral line; lateral line tubules with 3 to 5 short branches. Dorsal IX, I 29-30; spines slender, fourth longest, about  $\frac{2}{5}$  length of head; soft dorsal scaled only at base. Anal II 7; first spine very short; second stronger than those of dorsal fin, length more than  $\frac{1}{3}$  that of head. Pectoral about  $\frac{2}{3}$  length of head. Pelvics shorter,  $\frac{3}{5}$  length of head. Caudal pointed, middle rays  $\frac{4}{5}$  to  $\frac{5}{6}$  as long as head. Silvery; back darker; dusky patches on opercular region; a dark spot superiorly in axil of pectoral; dorsal fins with blackish margins; pectorals, anal and caudal more or less dusky.

Apparently most nearly related to *S. aquila* (Lacepède), differing mainly in the somewhat larger scales, larger eye, pointed caudal fin, etc.

*Umbrina ronchus*, Valenc.

*Umbrina canariensis*, Steindachner, 1867, *SitzBer. Akad. Wiss. Wien*, LV1 (1), p. 638, pl. vi, fig. 1  
*Umbrina ronchus*, Steindachner, 1882, *Denkschr. Akad. Wiss. Wien*, XLV, p. 8.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 4 specimens, 280-370 mm.

*Hab.* West Africa.

### SPARIDAE

#### *Dentex maroccanus* (Cuv. and Val.).

Steindachner, 1894, *Notes Leyden Mus.*, xvi, p. 13.

St. 271. 30. vii. 27. Elephant Bay, Angola. Hand line, 18 m.: 2 specimens, 250, 265 mm.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 4 specimens, 180-205 mm.

*Hab.* West Africa.

#### *Dentex macrophthalmus* (Bloch).

Günther, 1859, *Cat. Fish.*, 1, p. 370.

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 2 specimens, 60-88 mm.

*Hab.* Mediterranean and adjacent seas; West Africa.

#### *Dentex filusus*, Valenc.

Steindachner, 1868, *Sitzber. Akad. Wiss. Wien*, LVII (1), p. 975.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 1 specimen, 295 mm.

*Hab.* Coast of Algiers and West Africa; South-east Africa.

#### *Dentex cuninghami*, Regan.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 3 specimens, 255-320 mm.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64-65 m.: 1 specimen, 120 mm.

*Hab.* Angola.

#### *Pagellus mormyrus* (Linn.).

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 2 specimens, 50-60 mm.

#### *Box boops* (Linn.).

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 10 specimens, 115-135 mm.

#### *Diplodus rondeleti* (Cuv. and Val.).

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 6 specimens, 80-110 mm.

### MAENIDAE

#### *Pterosmaris melanurus* (Cuv. and Val.).

*Smaris melanurus*, Steindachner, 1881, *Denkschr. Akad. Wiss. Wien*, XLIV, p. 26, pl. ii, fig. 2.

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 1 specimen, 100 mm.

*Hab.* Tropical West Africa.

### KYPHOSIDAE

#### *Kyphosus incisor* (Cuv. and Val.).

Jordan and Evermann, 1898, *Bull. U.S. Nat. Mus.*, XLVII (2), p. 1386.

St. 271. 29. vii. 27. Elephant Bay, Angola. Seine net, 5-0 m.: 3 specimens, 285-295 mm.

*Hab.* West Indies; Brazil; West Africa (Angola).

The above specimens appear to be identical with one in the British Museum collection from Rio de Janeiro, so that, like *K. sectatrix* (Linn.), this species is found on both sides of the Atlantic. It differs from *K. sectatrix* in having a longer anal fin, with 13 soft-rays, longer pelvics, smaller scales above the lateral line, and a different coloration. *K. gallvei*, Cunningham, from St Helena, is doubtfully distinct from *K. sectatrix*, which has been recorded from Madeira and the Canary Islands on the eastern side of the Atlantic.

#### LABRIDAE

*Julis atlantica*, (Günther).

*Coris atlantica*, Günther, 1864, *Cat. Fish.*, iv, p. 197.

St. 283. 13. viii. 27. Annobon Island, Gulf of Guinea. Hand line: 1 specimen, 250 mm.

*Hab.* Cape Verde Islands; West Africa.

In life the body is said to be coloured a brilliant ultramarine blue, with some green patches; red about the cheeks and at base of dorsal fin.

#### TRICHIURIDAE

*Trichiurus lepturus*, Linn.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 2 specimens, 225, 960 mm.

#### GOBIIDAE

*Periophthalmus barbarus* (Linn.).

9. viii. 27. French Congo. Shore collection: 9 specimens, 65–155 mm.

*Gobius* (*Gobius*) *angolensis*, sp.n.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 37 specimens, 37–100 mm. (holotype, a male, 95 mm.).

Body moderately compressed, depth 4 to  $4\frac{1}{4}$  in the length, length of head 3 to  $3\frac{1}{5}$ . Breadth of head usually rather less than its depth, which is  $\frac{2}{3}$  to  $\frac{3}{4}$  of its length. Snout short and obtuse, as long as or rather shorter than eye, diameter of which is  $3\frac{1}{4}$  to about 4 in length of head; interorbital space very narrow. Jaws equal anteriorly; maxillary extending to below anterior part of eye; no distinct canine teeth; tongue truncate or slightly bilobate. Head naked, except for 3 or 4 scales on upper part of operculum; nape scaled, with a shallow median groove; body covered with ciliated scales, 27 to 29 in a longitudinal series, 7 or 8 (occasionally 9) in a transverse series between second dorsal and anal fins; breast scaled. Cutaneous papillae of head well developed, the principal series arranged as in the accompanying diagram. Dorsal VI, I 11–12; the two fins narrowly separated; second or second and third rays of first dorsal more or less prolonged and filamentous in males, as long as or longer than head; second dorsal and anal elevated. Anal 11–12. Caudal obtusely pointed, longest rays about as long as head. Pectoral a little shorter than head. Length of pelvics about  $\frac{2}{3}$  the distance from their base to the anal fin. Yellowish brown, with two broad dusky patches on back and sides, one below each dorsal fin; usually a black spot or vertical bar at base of caudal; first dorsal and anal dusky; second dorsal and caudal with dark bars separated by narrower pale (yellow in life) interspaces; pectorals and pelvics dusky.



This species is most nearly related to *G. niger*, Linn., of which *G. jozo*, Linn. is probably a synonym, and to *G. roulei*, De Buen. From both species it may be distinguished by the larger head, fewer scales in a longitudinal series (27–29 instead of 33–39), the long filamentous rays of the first dorsal fin in the male, the number and arrangement of the cutaneous papillae on the head, particularly in the nuchal and infraorbital series, and by the coloration. Further, in *G. niger* and *G. roulei* the nape is completely or almost completely without scales.<sup>1</sup> From *G. maindroni*, Sauvage, from Senegal, Sierra Leone and Niger, it may be distinguished by the larger head and eye and by the coloration.

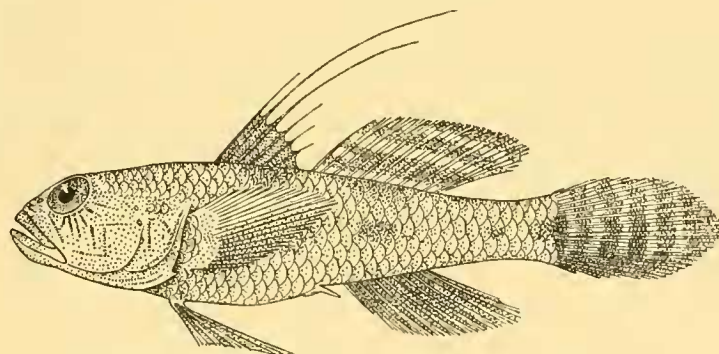


Fig. 5. *Gobius (Gobius) angolensis*. Holotype.  $\times 1$ .

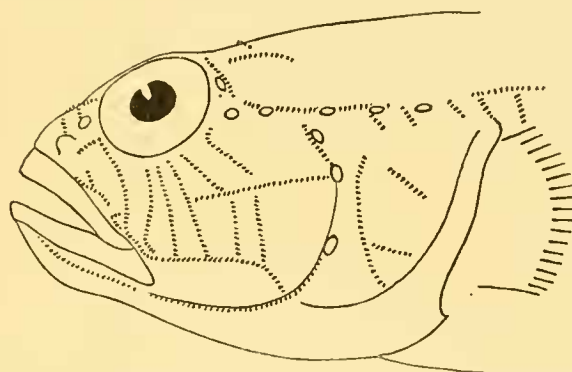


Fig. 6. Diagrammatic view of head of *Gobius (Gobius) angolensis*, showing the arrangement of the series of cutaneous papillae.

#### *Gobius*, sp.

St. 283. 13. viii. 27. Off Annobon, Gulf of Guinea. Large dredge, 18–30 m.: 2 specimens, 17, 18 mm.

#### *Acentrogobius koumansi*, sp.n.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 44 specimens, 30–100 mm. (holotype, 100 mm.).

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 6 specimens, 90–105 mm.

<sup>1</sup> An example of this species was sent to Dr Fernando de Buen of Madrid, who has made a special study of the Gobies of this subgenus, and I am greatly indebted to him for his opinion as to its relationships.

Body compressed, depth  $4\frac{1}{5}$  to  $4\frac{2}{3}$  in the length, length of head 3 (young) to  $3\frac{1}{2}$ . Breadth of head much less than its depth, which is about  $\frac{2}{3}$  of its length. Snout short, rounded, shorter than eye, diameter of which is  $2\frac{3}{4}$  (young) to  $3\frac{1}{3}$  in length of head; interorbital space very narrow, the eyes being nearly contiguous in the young. Mouth oblique, the jaws equal anteriorly or lower a little prominent; maxillary extending to below middle of eye; both jaws with several rows of teeth, those of the outer row enlarged, those of the innermost row a little enlarged; teeth of outer row of upper jaw stronger than those of lower, forming more or less distinct curved canines; no canines

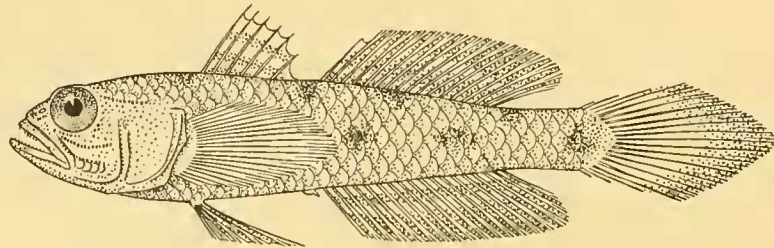


Fig. 7. *Acentrogobius koumansi*. Holotype.  $\times 1$ .

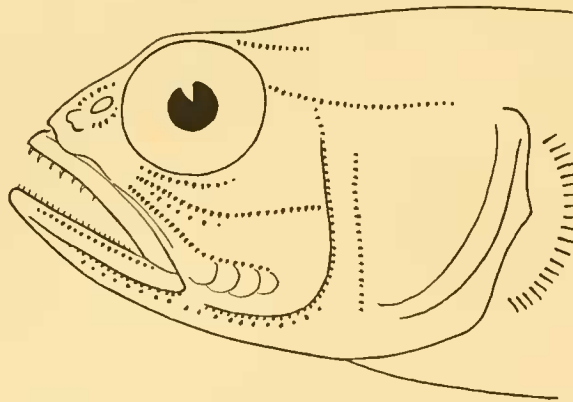


Fig. 8. Diagrammatic view of head of *Acentrogobius koumansi*, showing the arrangement of the series of cutaneous papillae.

in lower jaw; tongue truncate or slightly bilobate. Head naked except on upper surface behind eyes and on lower part of cheek, where there is a row of 3 or 4 scales; body covered with finely ciliated scales; 25 to 27 in a longitudinal series, 7 or 8 in a transverse series between second dorsal and anal fin; breast scaled. Cutaneous papillae on head well developed, arranged as in the accompanying diagram. Dorsal VI, I 16-17; the two fins narrowly separated; second, third and fourth rays of first dorsal sometimes a little prolonged, longest nearly as long as head (males?); second dorsal and anal elevated. Anal 18-20. Caudal pointed, the middle rays longer than the head. Pectoral without free, silk-like rays, nearly as long as head. Pelvics extending nearly to vent. Yellowish brown, with about 5 dark spots along each side and usually with traces of a row of similar spots along back just below dorsal fins; fins more or less dusky distally; indistinct greyish bars on spinous dorsal.

According to Koumans' synopsis of the genera of Gobiinae (1931) this species must be placed either in *Oxyurichthys* or in *Acentrogobius*.<sup>1</sup> It resembles certain species of *Oxyurichthys*, especially in the large mouth, number of dorsal and anal rays, pointed caudal, etc., but differs in the form of the dentition. It fits much better into *Acentrogobius*, as defined by Koumans, and the diagnosis of that genus may be amended for its reception. It appears to be related to *A. schlegeli* (Günther), from which it may be readily distinguished by the different dentition, the larger eye, and the greater number of dorsal and anal rays.

#### BLENNIIDAE

##### *Blennius velifer*, sp.n.

St. 271. 30. vii. 27. Elephant Bay, Angola. Shore collection. 17 specimens (12 males, 5 females), 25-50 mm. (holotype, a male, 50 mm.).

Depth of body  $4\frac{3}{5}$  to 5 in the length, length of head about 4. Snout obtuse, the anterior profile steep in males, less abrupt in females. Diameter of eye  $3\frac{2}{3}$  to more than

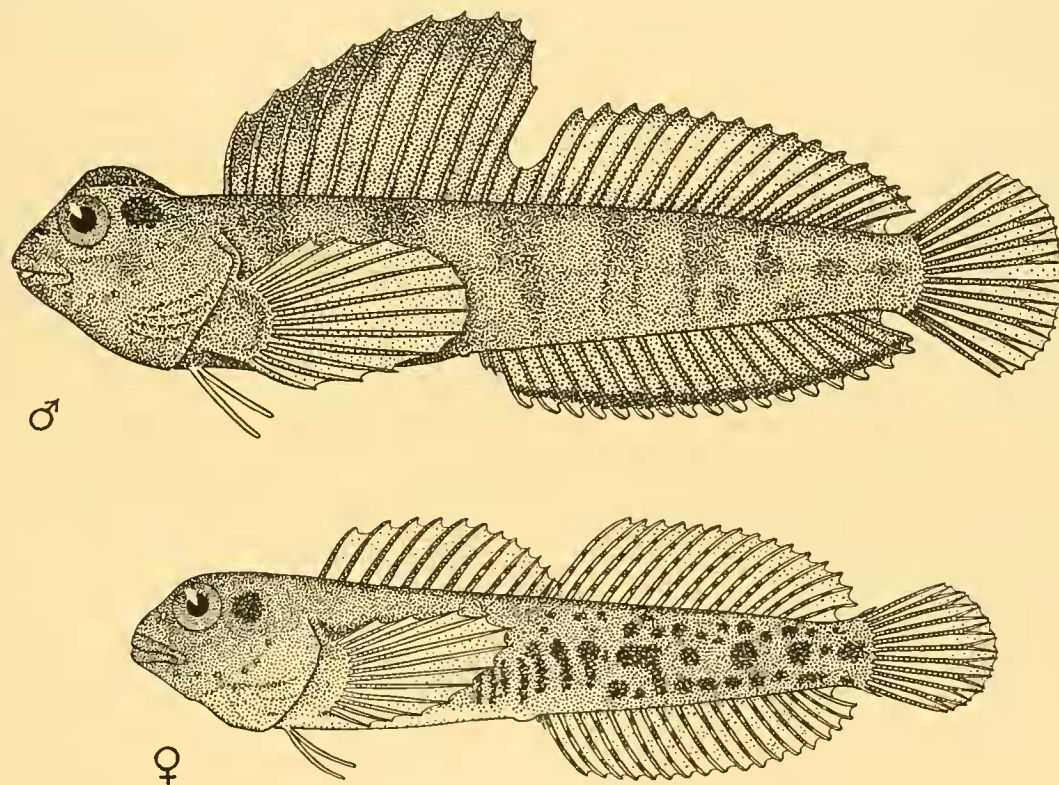


Fig. 9. *Blennius velifer*.  $\times 3$ .

4 in length of head and greater than interorbital width. Maxillary extending to below anterior part or middle of eye; two large canines in lower jaw and usually two smaller ones in the upper jaw. A small simple tentacle at each anterior nostril; no orbital tentacles; no occipital tentacles or filaments, but males with a well-marked occipital

<sup>1</sup> I am greatly indebted to Dr F. P. Koumans for his kindness in examining a specimen of this species, and for his opinion as to its probable systematic position. He has also examined an example of *Gobius angolensis*.



crest. Dorsal XII 14-15; distinctly notched; commencing above upper angle of gill-opening and ending just before the caudal; spinous portion higher than soft portion in males, rather lower than soft part in females. Anal 16-20. Caudal rounded. Pectoral as long as or longer than head, not or scarcely extending to above origin of anal. Males with traces of dark cross-bars on sides, and with some large dark spots on caudal region of body; a round black spot immediately behind the eye; spinous part of dorsal chocolate brown; anal with a narrow dark submarginal band, each ray tipped with white; females with numerous dark spots on hinder part of body, and with irregular cross-bars anteriorly; a dark spot behind the eye as in males; anal fin spotted with brown.

This species appears to be most nearly related to *B. trigloides*, Cuv. and Val., and *B. bufo*, Lowe.

*Blennius*, sp.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Net (4 mm. mesh) attached to back of trawl, 64-65 m.: 1 specimen, 23 mm.

This is perhaps the young of *B. ocellaris*, Linn., but appears to have a deeper body and rather fewer rays in the dorsal fin (XI 13).

## BROTULIDAE

*Brotula barbata* (Schn.).

Regan, 1915, *Ann. Mag. Nat. Hist.* (8) xv, p. 128.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73-91 m.: 2 specimens, 510, 560 mm.

## SCORPAENIDAE

*Scorpaena canariensis* (Sauvage).

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64-65 m.: 2 specimens, 60, 130 mm.

See description below.

*Scorpaena angolensis*, sp.n.

St. 271. 29. vii. 27. Elephant Bay, Angola. Large fish-trap, 20 m.: 1 specimen, 80 mm.

See description below.

## REVISION OF THE SCORPAENIDAE OF THE MEDITERRANEAN AND NEIGHBOURING PARTS OF THE ATLANTIC

The difficulty experienced in identifying the Scorpaenids collected by the 'Discovery' has led me to undertake an examination of all the species occurring in the Mediterranean and in the eastern Atlantic. Previous authors have found it difficult to ascertain the limits of the genera found in the Atlantic, and my own work has shown quite clearly that, in order to arrive at any definite conclusions concerning the subdivision of the family, a thorough revision of the species of the world will be necessary. It follows, therefore, that the arrangement adopted here is a tentative one, and although I have succeeded in obtaining a satisfactory idea as to the species found in the region under consideration, the grouping of these into genera is open to criticism.

## Key to the Genera

- I. 30 to 31 vertebrae; dorsal with 15 spines, anal with 7 or 8 soft-rays; spines on upper surface of head feeble; no distinct suborbital ridge; interorbital space flat; head densely scaled; pectoral with narrow base, some of its rays branched ... .. *SEBASTES*.
- II. 24 to 26 vertebrae; dorsal with 11 to 13 spines, anal with 5 soft-rays; a more or less distinct suborbital ridge, generally armed with spines.
- A. Dorsal continuous, though somewhat notched, the penultimate spine at least  $\frac{1}{2}$  as long as the last; second anal spine generally longer than third; interorbital space always more or less concave, its width less than diameter of eye.
1. Dorsal with 13 spines; palatines without teeth ... .. *SCORPAENODES*.
2. Dorsal with 12 (occasionally 11 or 13) spines; palatines with teeth.
- a. Pectoral with all the rays simple, and with narrow base; 13 or 14 gill-rakers on lower part of anterior arch; head more or less scaled ... .. *PONTINUS*.
- b. Pectoral with some of the rays branched (except in very young), and with broad base.
- α. Gill-rakers of moderate length, 16 to 22 on lower part of anterior arch; lower rays of pectoral free from membrane for at least  $\frac{1}{3}$  of their length, and upper part of hinder edge of fin truncate; suborbital ridge smooth or with one small spine. *HELICOLENUS*.
- β. Gill-rakers rather short and stout, 9 to 12 on lower part of anterior arch; lower rays of pectoral free from membrane only at their tips, and hinder edge of fin evenly rounded; suborbital ridge generally armed with spines *SCORPAENA*.
- B. Dorsal deeply notched, the penultimate spine only about  $\frac{1}{3}$  as long as the last; second anal spine much shorter than third; interorbital space flat, its width greater than diameter of eye; pectoral with 20 or more rays, some of them branched; dorsal with 12 spines; lateral line a naked groove with prominent tubes ... .. *SETARCHES*.

Genus *Sebastes*, Cuvier

1829, *R. Anim.*, ed. 2, II, p. 166. Type *Perca norvegica*, Ascan.

*Eusebastes*, Sauvage, 1878, *Nouv. Arch. Mus. H.N. Paris* (2) 1, p. 115. Type *Sebastes septentrionalis*, Gaimard.

As now restricted, this genus includes only two species in the North Atlantic: *S. marinus* (Linn.) and *S. viviparus*, Krøyer. These have been regarded by many authors as identical, but, according to Swenander,<sup>1</sup> Jensen,<sup>2</sup> Duncker,<sup>3</sup> Saemundsson<sup>4</sup> and others, the species are valid.

Genus *Scorpaenodes*, Bleeker

1857, *Nat. Tijdschr. Ned.-Ind.*, XIII, p. 371; 1876, *Versl. Akad. Wet. Amsterdam* (2) IX, p. 296. Type *Scorpaena polylepis*, Bleeker.

*Scorpaenodes africanus*, Pfaff.

1933, *Vid. Medd. Dansk nat. For.*, XCIV, p. 311, fig. 13.

*Hab.* Senegal.

Known only from the holotype, 65 mm. in total length, from Dakar.

<sup>1</sup> 1906, *Kgl. Norske Vidensk. Selsk. Skr.* (1905), No. 9, p. 7.

<sup>2</sup> 1922, *Vid. Medd. nat. For. Kjöbenhavn*, LXXIV, p. 105.

<sup>3</sup> 1927, in Grimpe and Wagler, *Tierwelt Nord- u. Ostsee*, Lief. x, Teil XII, Heft 2, p. 2.

<sup>4</sup> 1932, in Joubin, *Faun. Ichth. Atlant. Nord*, x, figs.

Genus *Pontinus*, Poey

1858, *Mem. Hist. Nat. Cuba*, 11, p. 172. Type *Pontinus castor*, Poey.

*Sebastoplus*, Gill, 1863, *Proc. Acad. Nat. Sci. Philad.*, p. 208. Type *Scorpaena kuhli*, Bowdich.

Poey described two species of the genus *Pontinus*, *P. castor* and *P. pollux*, both probably shallow-water forms from the West Indies. I have not examined specimens of either species, and follow Goode and Bean in regarding them as congeneric with *Scorpaena kuhli*, Bowdich, which is the type of Gill's genus *Sebastoplus*. The genus does not occur in the Mediterranean, and there are only two species in the eastern Atlantic, which may be distinguished as follows:

- I. 5 or 6 series of scales between last soft-ray of dorsal and lateral line, 9 to 11 on cheek below suborbital ridge ... .. *kuhli*.
- II. 3 series of scales between last soft-ray of dorsal and lateral line, 6 or 7 on cheek below suborbital ridge ... .. *accraensis*.

*Sebastes nigropunctatus*, Günther, from St Helena, is a *Pontinus*, and may be distinguished from both the above by the form of the dorsal spines, none of which are elongate, and by the coloration. Several species have been described from the western Atlantic, but these are not represented in the British Museum collection.<sup>1</sup>

*Pontinus kuhli* (Bowdich).

*Scorpaena kuhlii*, Bowdich, 1825, *Excur. Madeira*, p. 123.

*Sebastes kuhlii*, Lowe, 1839, *Trans. Zool. Soc.*, 11 (3), p. 176; Lowe, 1860, *Hist. Fish. Madeira*, p. 115, pl. xvii; Günther, 1860, *Cat. Fish.*, 11, p. 102; Steindachner, 1867, *Sitzber. Akad. Wiss. Wien*, LVI (1), p. 671; Capello, 1881, *Mem. Acad. Sci. Lisboa*, XLVI (N.S. VI, pt. 1), p. 11; Vaillant, 1888, *Expéd. Sci. 'Travailleur' et 'Talisman'*, Poiss., p. 370; Vinciguerra, 1893, *Atti Soc. Ital. Sci. Nat. Milano*, XXXIV, p. 312; Collett, 1896, *Rés. Camp. Sci. Monaco*, X, p. 13.

*Sebastes filifer*, Valenciennes, 1843, in Webb and Berthelot, *Canaries (Ichth.)*, p. 21, pl. ii, fig. 2.<sup>2</sup>

*Sebastoplus kuhlii*, Gill, 1863, *Proc. Acad. Nat. Sci. Philad.*, p. 208.

*Sebastes (Sebastichthys) filifer*, Sauvage, 1878, *Nouv. Arch. Mus. H.N. Paris* (2) 1, p. 118.

*Pontinus kuhlii*, Goode and Bean, 1895, *Ocean. Ichth.*, p. 253.

*Pontinus filifer*, Goode and Bean, 1895, *t.c.*, p. 254.

Depth of body about 3 in the length, length of head  $2\frac{1}{6}$  to  $2\frac{1}{4}$ . Snout longer than eye, diameter of which is  $4\frac{1}{2}$  to 5 in length of head and  $1\frac{2}{3}$  to more than twice interorbital width. Two strong, backwardly curved spines on the preorbital; suborbital ridge with 3 or 4 spines; 5 preopercular spines, the uppermost strongest and with a smaller spine at its base, the lowermost sometimes wanting. Gill-rakers of moderate length, the longest less than  $\frac{1}{2}$  diameter of eye; 13 or 14 (including rudiments) on lower part of anterior arch. Scales spinulose and ciliated; 5 or 6 series between last soft-ray of dorsal and lateral line; breast scaled. Dorsal XII 9-10;<sup>3</sup> generally the second and

<sup>1</sup> *Sebastes nematophthalmus*, Günther (1860, *Cat. Fish.*, 11, p. 99) was described from two specimens, a large stuffed one believed to have come from Mauritius, and one in spirit, 165 mm. long, which formed part of a collection made by Sir R. Schomburgk in the West Indies. These appear to represent distinct species. I cannot find any trace of the "long, slender, tapering filament above the posterior angle of the orbit" in the West Indian specimen, which is an undoubted *Pontinus*.

<sup>2</sup> I am indebted to Dr W. H. Longley for notes upon the type of this species in the Paris Museum.

<sup>3</sup> The last ray of both dorsal and anal fins in all Scorpaenids is cleft nearly to its base, and has consequently been counted as two rays by many workers.



third spines much longer than the remainder, but sometimes only the second or only the third elongate; longest spines  $1\frac{4}{5}$  to  $2\frac{1}{4}$  in length of head. Anal III 5. Pectoral with 16 or 17 rays, the lower ones a little thickened and free from membrane at their tips; fin extending to a little beyond vent. Pale brownish, the upper parts of the sides spotted with darker brown, the spots sometimes tending to form irregular longitudinal rows; dorsal and sometimes the caudal fin spotted with brown; other fins nearly uniform.

*Hab.* Coast of Portugal; Madeira; Canaries; Azores; etc.

In the British Museum 10 specimens, 210–320 mm. in total length.

*Sebastes (Sebastichthys) bibroni*, Sauvage,<sup>1</sup> described from a single specimen 208 mm. in total length from Sicily, seems to belong to this genus. Dr W. H. Longley has kindly examined the type in the Paris Museum for me, and reports that the pectoral rays (18) are all simple and that there are 13 gill-rakers (including rudiments) on the lower part of the anterior arch, the longest being more than  $\frac{1}{2}$  the diameter of the eye. The length of the first dorsal spine is 13 mm., the second 36 mm., the third 34 mm., and the fourth 25 mm. It is possible that this species will prove to be identical with *Pontinus kuhli*, to which it is obviously very closely related, but I have hesitated to unite the two forms, especially in view of the fact that *P. kuhli* has not been recorded from the Mediterranean.

*Pontinus accraensis*, sp.n.

Closely related to *P. kuhli*. Depth of body about 3 in the length, length of head a little more than 2. Snout very little longer than eye, diameter of which is about 4 in length of head and  $2\frac{1}{2}$  times the interorbital width. The spines above the anterior angles of the orbits are directed upwards and outwards instead of posteriorly; the second preopercular spine is considerably stronger, this being generally very inconspicuous in *P. kuhli*, and the fourth has three points. 12 gill-rakers on lower part of anterior arch. 3 series of scales between last soft-ray of dorsal and lateral line, 6 or 7 on cheek below suborbital ridge. Dorsal XII 9; only the second spine elongated, length  $2\frac{4}{5}$  in that of head. Anal III 5. Pectoral with 17 rays. The dark spots on the upper part of the body are more distinct, and there is a row of spots along the lateral line; the caudal as well as the soft dorsal fin is ornamented with small dark spots.

*Hab.* Accra, Gold Coast.

Only the holotype known, a specimen 215 mm. in total length collected and presented to the British Museum by Dr F. R. Irvine in 1930.

#### Genus *Helicolenus*, Goode and Bean

1895, *Ocean. Ichth.*, p. 248. Type *Scorpaena dactyloptera*, Delaroche.

There appear to be four species of this genus in the Mediterranean and Atlantic, one of which (*H. maderensis*) occurs only off the American coast, and another at the Cape. The other two may be distinguished as follows:

1. Diameter of eye  $2\frac{3}{4}$  to 4 in head (in specimens of 145 to 230 mm.); only one or two pairs of spines on occipital region; body uniformly coloured or with irregular dark markings on upper parts of sides ... .. *dactylopterus*.

<sup>1</sup> 1878, *Nouv. Arch. Mus. H.N. Paris* (2) 1, p. 116, pl. i, fig. 3.

- II. Diameter of eye  $3\frac{3}{4}$  to 4 in head (in specimens of 63 and 103 mm.); 3 pairs of spines on occipital region; body mottled with dark brown ... .. *microphthalmus*.

***Helicolenus dactylopterus* (Delaroche).**

? *Scorpaena malabarica*, Schneider, 1801, in Bloch, *Syst. Ichth.*, p. 194.

*Scorpaena dactyloptera*, Delaroche, 1809, *Ann. Mus. H.N. (Paris)*, xiii (77), p. 337, pl. xxii, fig. 9; Risso, 1810, *Ichth. Nice*, p. 186; Risso, 1826, *Hist. Nat. Europ. Mérid.*, iii, p. 369; Smitt, 1893, *Scand. Fish.*, 1, p. 154, fig. 43; Holt and Calderwood, 1895, *Sci. Trans. R. Dublin Soc.* (2) v, p. 409, pl. xlii, fig. 1; Holt and Byrne, 1908, *Fisheries Ireland Sci. Invest.*, 1906, v, p. 9, pl. i; Duncker, 1927, in Grimpe and Wagler, *Tierwelt Nord- u. Ostsee*, Lief. x, Teil xx, Heft 2, p. 4, fig. 2.

*Sebastes imperialis*, Cuvier, 1829, *R. Anim.*, ed. 2, ii, p. 167; Cuvier and Valenciennes, 1829, *Hist. Nat. Poiss.*, iv, p. 336; Lowe, 1839, *Trans. Zool. Soc.*, ii (3), p. 175; Lowe, 1860, *Hist. Fish. Madeira*, p. 171, pl. xxiv.

*Sebastes kuhlii*, Valenciennes, 1843, in Webb and Berthelot, *Canaries (Ichth.)*, pl. ii, fig. 1.

*Sebastes dactylopterus*, Günther, 1860, *Cat. Fish.*, ii, p. 99; Moreau, 1881, *H.N. Poiss. France*, ii, p. 317, fig. 117; Steindachner and Döderlein, 1885, *Denkschr. Akad. Wiss. Wien*, XLIX, p. 201 [*S. hilgendorfi*, Döderlein MS.]; Carus, 1889-93, *Prodr. Faun. Medit.*, ii, p. 638; Collett, 1896, *Rés. Camp. Sci. Monaco*, x, p. 12; Roule, 1907, *Arch. Zool. expér. gén.*, (4) vi, *Notes et Revue*, p. xv; Jaquet, 1907, *Bull. Inst. océan. Monaco*, cix.

*Helicolenus dactylopterus* (part), Goode and Bean, 1895, *Ocean. Ichth.*, p. 249.

*Scorpaena (Helicolenus) dactyloptera*, Fage, 1918, *Rep. Danish Ocean. Exped. 1908-10*, ii, A 3, p. 102.

Depth of body  $2\frac{4}{5}$  to  $3\frac{1}{3}$  in the length, length of head  $2\frac{1}{2}$  to  $2\frac{2}{3}$ . Snout shorter than eye, diameter of which is  $2\frac{3}{4}$  to 4 in length of head and 2 to  $2\frac{1}{2}$  times interorbital width. Praeorbital spines feeble; suborbital ridge generally smooth, but sometimes a very small spine below posterior edge of eye; 5 praeopercular spines; a spine above the front of each orbit and 3 or 4 above its posterior angle; one or two pairs of spines on the occipital region. Maxillary with a patch of scales in the centre. Gill-rakers of moderate length, the longest  $\frac{1}{4}$  to  $\frac{1}{3}$  diameter of eye; 16 to 18 on lower part of anterior arch. Scales spinulose and ciliated; about 5 series between last soft-ray of dorsal and lateral line; breast scaled. Dorsal XII (occasionally XIII) 12 (-14); third or fourth spines generally longest,  $2\frac{1}{3}$  to nearly 3 (large specimens) in length of head. Anal III 5. Pectoral with 19 rays, the 2 uppermost simple, the next 8 or 9 branched, and the lowermost 8 or 9 simple and sometimes somewhat thickened; fin extending to above vent or a little beyond. Pale yellowish brown (red or pinkish in life), paler below; sometimes with some dark markings forming irregular bars on upper parts of sides, generally more prominent in the young; pharynx blackish or dark brown.<sup>1</sup>

*Hab.* Mediterranean and adjacent parts of the Atlantic, northwards to Scandinavia, southwards to the Cape Verde Islands; Azores; Japan (?).

In the British Museum numerous specimens, 115-230 mm. in total length.

There are 4 specimens from Japan in the British Museum collection, 145-230 mm. in total length, but all are in somewhat poor condition. After careful comparison I am unable to detect any important differences between these specimens and some of

<sup>1</sup> For a detailed account of the variation in the coloration of this species see Holt and Byrne (1908).

equal size from the Atlantic. *Helicolenus dactylopterus* is said to be common on the western side of the Atlantic, mainly between latitudes 30° and 40° N, but, judging from a single specimen of 122 mm. length, taken by the 'Albatross' in the North-West Atlantic (40° 00' 15" N, 70° 55' 30" W) at a depth of 136 fathoms, this should be a distinct species, distinguishable by the smaller eye, which is about  $3\frac{1}{2}$  in length of head and about twice the interorbital width, less deeply concave interorbital region, and by the constant presence of a small spine on the suborbital ridge. The scales may be a little larger in the American form, but the specimen examined is in a poor state of preservation. The Western Atlantic species will stand as *H. maderensis*, Goode and Bean, a somewhat unfortunate name, as it has been clearly shown that this form does not occur at all on the eastern side of the Atlantic. *H. maculatus* (Cuv. and Val.), from the Cape, is closely related to *H. dactylopterus*, but may be readily distinguished by the rather longer and more numerous gill-rakers (21 or 22), larger scales, and by the coloration.

*H. dactylopterus* is usually found in fairly deep water, chiefly between 100 and 400 fathoms, but young and half-grown individuals have been recorded from lesser depths. The maximum size of the species appears to be about 24 inches.

*Helicolenus microphthalmus*, Norman.

1935, *Proc. Zool. Soc.*, p. 612, fig. 1.

*Hab.* Off Saltburn, Yorks; 30 fathoms.

Known only from the types, 63 and 103 mm. in total length.

### Genus *Scorpaena*, Linnaeus

1758, *Syst. Nat.*, ed. 10, p. 266. Type *Scorpaena porcus*, Linnaeus.

There are numerous species of this genus in all tropical and temperate seas, presenting considerable variation in squamation and in the armature of the head. It seems certain that a careful revision of all the species would reveal definite characters for the subdivision of the genus, and even the few species dealt with here represent a somewhat heterogeneous assemblage. It is probable that the species with the breast naked (*Scorpaena*) will have to be separated from the remainder, and it is very doubtful whether the species described by Koehler as *echinata* (? = *cristulata*, Goode and Bean) should be included.<sup>1</sup> The presence or absence of an occipital pit, originally believed to be of primary importance, proves to be of little value as a generic character, and within the genus every gradation exists between a deep quadrate pit on the occiput and a very shallow depression or none at all.

There appear to be nine species of *Scorpaena* in the Mediterranean and adjacent parts of the Atlantic, of which one was originally described by Sauvage in 1878, but has not since been recognized, and another is described below as new to science.

<sup>1</sup> See p. 32 of this report.



## Key to the Mediterranean and Eastern Atlantic Species

- I. Breast naked; scales on head not visible, completely embedded in the skin.
  - A. Scales smooth, but with crenulate margins, small; 6 or 7 between last soft-ray of dorsal and lateral line; spines on suborbital ridge small or wanting ... .. *porcus*.
  - B. Scales ciliated, sometimes spinulose, larger; 3 to 5 between last soft-ray of dorsal and lateral line; spines on suborbital ridge well developed.
    1. Occipital pit present; base of pectoral broad, the lowermost ray inserted level with root of pelvic spine and more or less in advance of uppermost.
      - a. Pectoral with 18 (occasionally 17 or 19) rays; distance from origin of dorsal to anterior edge of occipital pit equal to or a little greater than eye; snout shorter than eye, which is  $3$  to  $4\frac{1}{5}$  in head.
        - $\alpha$ . Head  $2\frac{1}{3}$  to  $2\frac{1}{2}$  in length; pores on head numerous; supraorbital tentacle generally of moderate size or small ... .. *ustulata*.
        - $\beta$ . Head  $2\frac{1}{4}$  to  $2\frac{1}{3}$  in length; pores on head fewer; supraorbital tentacle larger,  $\frac{1}{3}$  to  $\frac{4}{5}$  eye ... .. *angolensis*.
      - b. Pectoral with 19 or 20 rays; distance from origin of dorsal to anterior edge of occipital pit  $1\frac{1}{2}$  to more than twice eye; snout longer than eye, which is  $4\frac{1}{2}$  to  $6\frac{3}{4}$  in head ... .. *scrofa*.
    2. No occipital pit; base of pectoral rather narrow, the lowermost ray inserted a little above level of root of pelvic spine and about opposite uppermost ... .. *canariensis*.
- II. Breast fully scaled; always some scales visible on opercular region, and often on cheek also.
  - A. Scales all cycloid; a well-developed occipital pit.
    1. Depth of head at origin of dorsal  $1\frac{1}{4}$  to  $1\frac{1}{3}$  in its length; supraorbital tentacle, when present, small; pectoral extending to vent or a little beyond,  $1\frac{1}{2}$  to  $1\frac{3}{5}$  in head ... .. *laevis*.
    2. Depth of head at origin of dorsal  $1\frac{1}{2}$  in its length; supraorbital tentacle large,  $\frac{2}{3}$  to  $\frac{3}{4}$  eye; pectoral extending nearly to origin of anal,  $1\frac{1}{4}$  in head ... .. *senegalensis*.
  - B. Scales spinulose and ciliated; no occipital pit.
    1. Pectoral with 15 or 16 rays; 2 or 3 rather feeble spines on posterior part of suborbital ridge; head  $2\frac{1}{2}$  to  $2\frac{3}{4}$  in the length ... .. *madurensis*.
    2. Pectoral with 21 or 22 rays; 7 or 8 strong spines on suborbital ridge, which is prominent; head  $2\frac{1}{6}$  to  $2\frac{1}{3}$  in the length ... .. *echinata*.

*Scorpaena porcus*, Linnaeus.

1758, *Syst. Nat.*, ed. 10, p. 266; Bloch, 1785, *Nat. auct. Fische*, III, p. 5, pl. clxxxi; Risso, 1810, *Ichth. Nice*, p. 187; Günther, 1860, *Cat. Fish.*, II, p. 107; Carus, 1889-93, *Prodr. Faun. Medit.*, II, p. 640; Roule, 1907, *Arch. Zool. expér. gén.* (4) VI, *Notes et Revue*, p. xvii; Jaquet, 1907, *Bull. Inst. océan. Monaco*, CIX; Fage, 1918, *Rep. Danish Ocean. Exped.* 1908-10, II, A 3, p. 103.

*Cottus massiliensis*, Förskal, 1775, *Descr. Anim.*, p. 24.

*Scorpaena massiliensis*, Lacepède, 1802, *Hist. Nat. Poiss.*, III, pp. 258, 269.

*Scorpaena fasciata*, Costa, 1850 (?), *Faun. Napoli*, II. *Pesci*, *Scorpaena*, p. 3, pl. iv.

Depth of body  $2\frac{1}{3}$  to nearly 3 in the length, length of head  $2\frac{1}{5}$  to  $2\frac{2}{3}$ . Snout as long as or rather shorter than eye, diameter of which is 4 to 5 in length of head and greater than interorbital width. No visible scales on head, but a number of pores. A deep occipital pit. Spines on preorbital strong, each with a single point, but those on suborbital ridge feebly developed or wanting. A well-developed supraorbital tentacle,

and a few membranous processes scattered over head. Length of band of palatine teeth about  $\frac{2}{3}$  diameter of eye. 11 or 12 gill-rakers on lower part of anterior arch. Scales smooth, with the hinder margins crenulate; 6 or 7 series between last soft-ray of dorsal fin and lateral line; breast naked. Dorsal XII 9; third, fourth and fifth spines longest,  $2\frac{1}{5}$  to  $3\frac{1}{3}$  in length of head. Anal III 5; third spine as long as or longer than second in adults, second spine longest in immature specimens. Pectoral with 16 or 17 rays, extending to above vent or a little beyond. Reddish brown, variously mottled with darker and dotted with deep black, the dots sometimes margining the darker areas; in smaller specimens the fins decorated with irregular dark spots, blotches and cross-bands; often a black blotch on hinder part of spinous dorsal; pectoral spotted and marbled with dark brown or black, some larger dark spots in the axil.

*Hab.* Mediterranean and adjacent parts of the Atlantic, straying northwards to the British Isles.

In the British Museum numerous specimens, 38–260 mm. in total length.

### *Scorpaena ustulata*, Lowe.

? *Scorpaena notata*, Rafinesque, 1810, *Car. N. Gen.*, p. 33.

*Scorpaena ustulata*, Lowe, 1841, *Proc. Zool. Soc.*, VIII (88 and 89), p. 36; Günther, 1860, *Cat. Fish.*, II, p. 110; Bellotti, 1888, *Atti Soc. Ital. Sci. Nat. Milano*, XXXI, p. 213, pl. iv, fig. 1; Carus, 1889–93, *Prodr. Faun. Medit.*, II, p. 641; Moreau, 1891, *H.N. Poiss. France*, Suppl. p. 26; Collett, 1896, *Rés. Camp. Sci. Monaco*, x, p. 10, pl. iv, fig. 15; Roule, 1907, *Arch. Zool. expér. gén.* (4) VI, *Notes et Revue*, p. xxi; Jaquet, 1907, *Bull. Inst. océan. Monaco*, cix; Fage, 1918, *Rep. Danish Ocean. Exped.* 1908–10, II, A 3, p. 103.

*Scorpaena porcus*, Costa, 1850 (?), *Faun. Napoli*, II. *Pesci*, *Scorpaena*, p. 2, pl. iii.

*Scorpaena teneriffea*, Jordan and Gunn, 1898, *Proc. Acad. Nat. Sci. Philad.*, p. 345.

Depth of body  $2\frac{3}{5}$  to 3 in the length, length of head  $2\frac{1}{3}$  to  $2\frac{1}{2}$ . Distance from origin of dorsal to anterior edge of occipital pit equal to or a little greater than diameter of eye. Snout blunt, shorter than eye, diameter of which is 3 to 4 in length of head and about twice the interorbital width. No visible scales on head, but numerous pores, which in preserved specimens give parts of the head a pustulate appearance. A deep occipital pit. Spines on preorbital strong, the anterior with two points; 4 well-developed spines on suborbital ridge. Supraorbital tentacle generally developed, sometimes small or even absent; its length generally  $\frac{1}{4}$  to  $\frac{1}{2}$  diameter of eye; sometimes a few membranous processes on head. Length of band of palatine teeth about  $\frac{1}{3}$  diameter of eye. 10 to 12 gill-rakers on lower part of anterior arch. Scales spinulose and ciliated; 3 or 4 series between last soft-ray of dorsal and lateral line; breast naked; a few membranous processes sometimes present on body. Dorsal XII 9 (XIII 8 in one specimen); third to fifth spines longest, 2 to  $2\frac{1}{3}$  in length of head. Anal III 5; second spine longer and stronger than third. Pectoral with 18 (occasionally 17 or 19) rays, extending to above origin of anal or not quite as far; base broad, the lowermost ray inserted level with root of pelvic spine and more or less in advance of uppermost. Reddish brown; nearly uniform or variously mottled with darker and paler on body and fins; often dotted with black; nearly always a black blotch on hinder part of spinous dorsal fin.

*Hab.* Mediterranean and adjacent parts of the Atlantic; Azores.

In the British Museum numerous specimens, 65–205 mm. in total length.

*Scorpaena angolensis*, sp.n.

Closely related to *S. ustulata*, but length of head  $2\frac{1}{4}$  to  $2\frac{1}{3}$  in that of fish. Diameter of eye  $3\frac{1}{2}$  to  $4\frac{1}{5}$  in length of head and  $1\frac{3}{4}$  to nearly twice interorbital width. Pores on head rather less numerous. Anterior praeorbital spine single or with a very small secondary spine at its base. Supraorbital tentacle larger, branched, its length  $\frac{1}{3}$  to  $\frac{4}{5}$  diameter of eye; membranous processes well developed on head and others on parts of body, especially in the region of the lateral line. Length of palatine band of teeth  $\frac{2}{5}$  or  $\frac{1}{2}$  diameter of eye. Dorsal XII 9; fourth and fifth spines longest, about twice in length of head. Anal III 5. Pectoral with 18 rays.

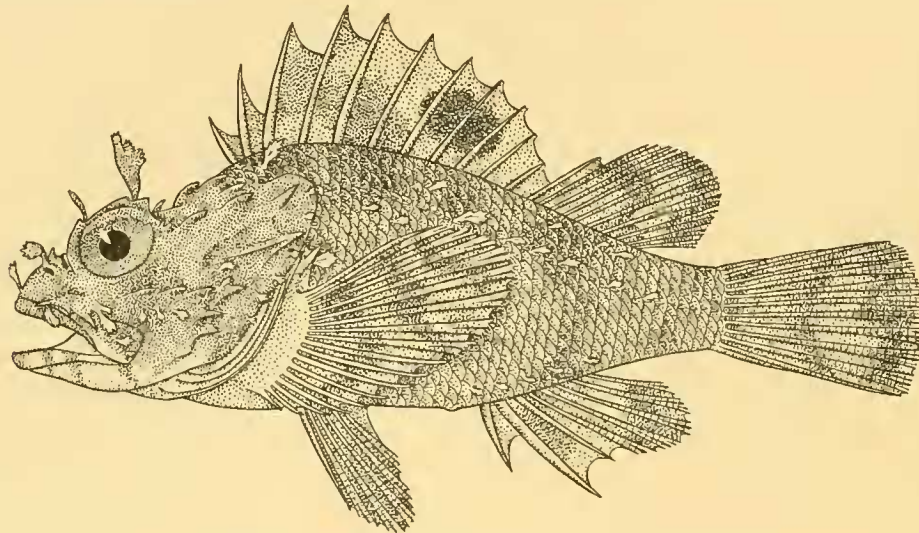


Fig. 10. *Scorpaena angolensis*. St. 271.  $\times 1\frac{1}{2}$ .

*Hab.* Coast of Angola.

In addition to the specimen collected by the Discovery Expedition, there are two more in the British Museum collection, 120 and 155 mm. in total length, found among the unidentified Scorpaenids. The larger of these has been selected as the holotype.

*S. angolensis* is very closely related to *S. ustulata*, and has probably been mistaken for that species. In addition to the differences mentioned in the description, if examples of equal size are compared, *S. angolensis* will be seen to have a more slender body and rather larger mouth.

*Scorpaena scrofa*, Linnaeus.

Linnaeus, 1758, *Syst. Nat.*, ed. 10, p. 266; Bloch, 1785, *Nat. ansl. Fische*, 111, p. 10, pl. clxxxii; Risso, 1810, *Ichth. Nice*, p. 188; Costa, 1850 (?), *Faun. Napoli*, II. *Pesci*, Scorpaena, p. 1, pl. ii; Lowe, 1860, *Hist. Fish. Madeira*, p. 105, pl. xvi; Günther, 1860, *Cat. Fish.*, 11, p. 108; Moreau, 1881, *H.N. Poiss. France*, 11, p. 310, fig. 116; Day, 1887, *Proc. Zool. Soc.*, p. 342; Carus, 1889–93, *Prodr. Faun. Medit.*, 11, p. 639; Roule, 1907, *Arch. Zool. expér. gén.* (4) VI, *Notes et Revue*, p. xix; Jaquet, 1907, *Bull. Inst. océan. Monaco*, cix; Holt and Byrne, 1908,



- Fisheries Ireland Sci. Invest.*, 1906, v, p. 26, fig.; Fage, 1918, *Rep. Danish Ocean. Exped.* 1908-10, II, A 3, p. 103; Metzelaar, 1919, *Trop. Atlant. Vissch.*, p. 285.  
*Scorpaena barbata*, Lacepède, 1802, *Hist. Nat. Poiss.*, III, p. 259.  
*Scorpaena lutea*, Risso, 1810, *Ichth. Nice*, p. 190; Risso, 1826, *H.N. Europ. Mérid.*, III, p. 371; Roule, 1907, *t.c.*, p. xx.  
*Scorpaena scrofa* var. *obesa*, Lowe, 1860, *t.c.*, p. 105; Goode and Bean, 1895, *Ocean. Ichth.*, p. 245.  
*Scorpaena scrofa* var. *histrio*, Lowe, 1860, *t.c.*, p. 106.

Depth of body  $2\frac{2}{3}$  to  $3\frac{1}{5}$  in the length, length of head  $2\frac{1}{6}$  to  $2\frac{2}{5}$ . Distance from origin of dorsal to anterior edge of occipital pit  $1\frac{1}{2}$  times to more than twice diameter of eye. Snout pointed, longer than eye, diameter of which is  $4\frac{1}{2}$  (young) to  $6\frac{3}{4}$  in length of head and equal to or as much as  $1\frac{1}{3}$  times interorbital width. No visible scales on head, and comparatively few pores. A somewhat shallow occipital pit. Praeorbital spines strong; two smaller intermediary spines between the principal ones; 4 well-developed spines on suborbital ridge. Supraorbital tentacle very variable in size, its length from  $\frac{1}{6}$  to  $\frac{5}{6}$  diameter of eye; sometimes altogether wanting; membranous processes variously developed on chin, preorbital, edge of preoperculum, and on other parts of head. Length of band of palatine teeth  $\frac{2}{3}$  to  $\frac{4}{5}$  diameter of eye. 10 to 12 gill-rakers on lower part of anterior arch. Scales ciliated; 4 or 5 series between last soft-ray of dorsal and lateral line; breast naked; usually a number of membranous filaments and processes on body, especially in the region of the lateral line and on the back. Dorsal XII 9 (occasionally XIII 8); third or fourth (sometimes fifth) spines longest,  $1\frac{4}{5}$  to  $2\frac{2}{3}$  (young) in length of head. Anal III 5; second spine subequal to or a little longer than, and stronger than third. Pectoral with 19 or 20 rays, extending to above vent or not as far; base broad, the lowermost ray inserted level with root of pelvic spine and in advance of uppermost. Coloration very variable; generally reddish brown or yellowish, the head, body and fins marbled and spotted with darker brown; in smaller specimens the markings on the fins tend to form irregular cross-bars; often a large black blotch on hinder part of spinous dorsal fin.

*Hab.* Mediterranean and adjacent parts of the Atlantic, ranging southwards to Madeira and beyond, and straying northwards to the British Isles.

In the British Museum numerous specimens, 140-480 mm. in total length.

This is a very variable species, particularly in the coloration, the size of the supra-orbital tentacle, and to some extent in the size of the scales. It is possible that the examination of a large series of examples would lead to the recognition of more than one form. As a general rule, specimens from the eastern Mediterranean appear to have the supraorbital tentacle better developed than those from its western end, but in examples from Madeira the size of the tentacle varies considerably.

#### *Scorpaena canariensis*, Sauvage.

- Sebastes (Sebastichthys) canariensis*, Sauvage, 1878, *Nouv. Arch. Mus. H.N. Paris* (2) 1, p. 117, pl. i, figs. 1, 2.  
*Pontinus canariensis*, Goode and Bean, 1895, *Ocean. Ichth.*, p. 255.

Depth of body 3 in the length, length of head  $2\frac{2}{3}$ . Snout about as long as eye, diameter of which is nearly 4 in length of head and  $1\frac{1}{2}$  times interorbital width. No

visible scales on head, but numerous small pores. No occipital pit. Two strong pre-orbital spines, and 3 or 4 on suborbital ridge. Supraorbital tentacle about  $\frac{1}{2}$  diameter of eye; other membranous processes at anterior nostril, on preorbital, and on edge of preoperculum; a few small processes on upper surface of eyeball. Palatine band of teeth very narrow, its length about  $\frac{2}{3}$  diameter of eye. 10 gill-rakers on lower part of anterior arch. Scales ciliated; 3 series between last soft-ray of dorsal and lateral line; breast naked; no membranous processes on body. Dorsal XII 9; third and fourth spines longest, about twice in length of head. Anal III 5; third spine a little longer than second. Pectoral with 18 rays, extending to beyond origin of anal; base rather narrow, the lowermost ray inserted a little above level of root of pelvic spine and about opposite uppermost. Pale yellowish brown, with indistinct, narrow, oblique, greyish stripes

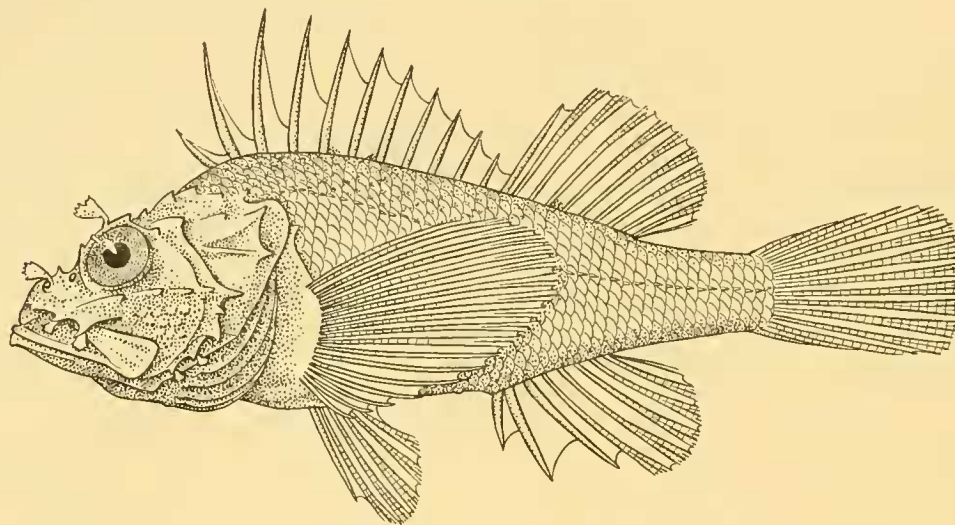


Fig. 11. *Scorpaena canariensis*.  $\times 1$ .

following the series of scales above the lateral line; fins all yellowish; a small dark spot on the membrane between the bases of the sixth and seventh dorsal spines, another between the seventh and eighth, and another between the third and fourth soft-rays.

*Hab.* Canary Islands; off the coast of Angola.

This species does not appear to have been recognized since originally described by Sauvage, and I have some doubt whether the examples from Angola are really referable to it. Dr W. H. Longley has sent me some notes on the type of *S. canariensis* (185 mm.) in the Paris Museum, but, although there appear to be some minor differences between this and the specimens described above, I do not think it advisable to give the latter a new name without actual comparison.

#### *Scorpaena laevis*, Troschel.

1866, *Arch. Naturgesch.*, xxxii (1), p. 206.

? *Scorpaena senegalensis*, Fowler, 1919, *Proc. U.S. Nat. Mus.*, lvi, p. 214.

*Hab.* Cape Verde Islands.

A description and figure of this species has been given on p. 6 of this report.

*Scorpaena senegalensis*, Steindachner.

1881, *Denkschr. Akad. Wiss. Wien*, XLIV, p. 31, pl. iv.

Very closely related to *S. laevis*, but depth of head at origin of dorsal  $1\frac{1}{2}$  in its length. Snout longer than eye, diameter of which is  $5\frac{1}{4}$  in length of head and about equal to interorbital width. Spines on head generally more acute. Supraorbital tentacle larger and much branched, its length  $\frac{2}{3}$  to  $\frac{3}{4}$  diameter of eye. Dorsal XII 9. Anal III 5. Pectoral with 19 rays, extending nearly to above origin of anal, its length (measured from upper angle)  $1\frac{1}{4}$  in that of head.

*Hab.* Coasts of tropical West Africa.

In the British Museum 2 specimens, 125 and 280 mm. in total length, from the Niger and the Gold Coast.

*Scorpaena madurensis*, Cuv. and Val.

1833, *Hist. Nat. Poiss.*, IX, p. 463.

*Sebastes maderensis*, Lowe, 1839, *Trans. Zool. Soc.*, 11 (3), p. 175; Günther, 1860, *Cat. Fish.*, 11, p. 102; Lowe, 1860, *Hist. Fish. Madeira*, p. 177; Steindachner, 1867, *Sitzber. Akad. Wiss. Wien*, LVI (1), p. 673; Collett, 1896, *Rés. Camp. Sci. Monaco*, x, p. 15; Collett, 1897, *Arch. Naturv. Christian.*, XIX, No. 7, p. 4; Kolombatović, 1904, *Hrvat. Naravosl. Društ. Glasnik*, xv, p. 186; Roule, 1907, *Arch. Zool. expér. gén.* (4) VI, *Notes et Revue*, p. xvi; Jaquet, 1907, *Bull. Inst. océan. Monaco*, CIX; Fage, 1918, *Rep. Danish Ocean. Exped.* 1908-10, 11, A 3, p. 102.

*Scorpaena rubellio*, Jordan and Gunn, 1898, *Proc. Acad. Nat. Sci. Philad.*, p. 344.

Depth of body  $2\frac{3}{4}$  to 3 in the length, length of head  $2\frac{1}{2}$  to  $2\frac{3}{4}$ . Snout as long as or shorter than eye, diameter of which is  $3\frac{2}{3}$  to  $3\frac{3}{4}$  in length of head and  $1\frac{1}{2}$  to  $1\frac{3}{4}$  times interorbital width. Head with numerous small pores; cheeks and opercular region with visible scales. No occipital pit. 2 strong preorbital spines, but only 2 or 3 spines on hinder part of suborbital ridge. A small supraorbital tentacle sometimes present;<sup>1</sup> a few small membranous processes on head. Length of band of palatine teeth a little more than  $\frac{1}{2}$  diameter of eye. 10 to 12 gill-rakers on lower part of anterior arch. Scales spinulose and ciliated; 5 series between last soft-ray of dorsal and lateral line; breast scaled; no membranous processes on body. Dorsal XII 9 or 10; fourth to sixth spines longest, about twice in length of head. Anal III 5; second spine longer and stronger than third. Pectoral with 15 or 16 rays, extending to above vent or beyond; base broad, the lowermost ray inserted level with root of pelvic spine and in advance of uppermost. Brownish, with four irregular darker cross-bars, the first just behind the head, the last on the caudal peduncle; dorsal, anal and caudal fins spotted and blotched with dark brown, the caudal with a broad transverse bar of the same colour; pectoral spotted and barred with brown, and with some small white spots in the axil.

*Hab.* Mediterranean and adjacent parts of the Atlantic; Azores.

In the British Museum 17 specimens, 62-140 mm. in total length.

<sup>1</sup> This is particularly well developed in two examples from Cyprus, which in all other respects appear to be exactly similar to examples of similar size from other parts of the Mediterranean and from Madeira.



*Scorpaena echinata*, Koehler.

1896, *Ann. Univ. Lyon*, xxvi, p. 478, pl. xxvii, figs. 4-6.

*Scorpaena cristulata*, Holt and Byrne, 1908, *Fisheries Ireland Sci. Invest.*, 1906, v, p. 20, pl. ii.

Depth of body  $2\frac{4}{5}$  to  $3\frac{1}{5}$  in the length, length of head  $2\frac{1}{6}$  to  $2\frac{1}{3}$ . Snout about as long as eye, diameter of which is  $4\frac{1}{4}$  to  $4\frac{2}{3}$  in length of head and twice or nearly twice width of interorbital space, which is very shallow. Top of head, cheeks and opercular region with visible scales. No occipital pit. Two blunt praeorbital spines; about 7 or 8 spines on suborbital ridge, which is prominent. No supraorbital tentacle, but some small filamentous processes scattered over the head. Length of band of palatine teeth about  $\frac{2}{3}$  diameter of eye. 11 or 12 gill-rakers on lower part of anterior arch. Scales spinulose and ciliated; 6 or 7 series between last soft-ray of dorsal and lateral line; a few filamentous processes along lateral line; breast scaled. Dorsal XI-XII 9-10; fourth to sixth spines longest,  $3\frac{1}{4}$  to  $3\frac{1}{2}$  in length of head; soft dorsal largely covered with scales. Anal III 5; second spine longer and stronger than third. Pectoral with 21 or 22 rays, extending about to above vent; the lower rays much thickened; base broad. Pelvics not nearly reaching vent. Yellowish brown (reddish in life); uniform or with irregular patches of black on body; a black area covering greater part of spinous dorsal, and another on soft dorsal; anal sometimes with a large black blotch; pectoral with a large dusky area in the centre.

*Hab.* Deep water off the west and south-west of Ireland and in the Bay of Biscay.

In the British Museum 6 specimens, 330-510 mm. in total length.

It is possible that this species will prove to be identical with *S. cristulata*, Goode and Bean, from off the coast of Georgia, U.S.A., as suggested by Koehler himself, but I have hesitated to unite two species from different sides of the Atlantic without actual comparison of specimens. I have not been able to examine examples of the American species, and, judging from the published description and figure (which exhibit certain discrepancies), cannot find any definite characters to separate this from *S. echinata*, although it is possible that the scales will prove to be larger in the latter. Meanwhile, I think it better to regard the two species as distinct.

*S. capensis*, Gilchrist and von Bonde,<sup>1</sup> which Barnard<sup>2</sup> doubtfully places in the genus *Sebastomus*, Gill, is clearly related to *Scorpaena echinata* and *S. cristulata*, but has thirteen dorsal spines. Further, the eye is larger, the interorbital space much narrower, the head less heavily armed, the maxillary broader, and the pectoral fin shorter. In spite of the difference in the number of dorsal spines, there can be little doubt that the two northern Atlantic species and that from the Cape are congeneric, and it seems probable that this character has considerably less value in the differentiation of genera than has generally been supposed.

<sup>1</sup> 1924, *Rep. Fish. Mar. Biol. Surv. S. Afric.*, III (1922), Spec. Rep. No. VII, p. 18.

<sup>2</sup> 1927, *Ann. S. Afr. Mus.*, XXI, p. 909.



Genus *Setarches*, Johnson

1862, *Proc. Zool. Soc.*, p. 176. Type *Setarches guentheri*, Johnson.

Only one species of this genus occurs in the Atlantic, namely, *S. guentheri*, Johnson, from Madeira.

In the British Museum 3 specimens, 220–290 mm. in total length, including the type of the species.

## PLATYCEPHALIDAE

*Platycephalus gruveli*, Pellegrin.

1905, *Bull. Soc. zool. Fr.*, xxx, p. 138, pl. iii, fig. 1; 1914, *Ann. Inst. océanogr. Paris*, vi (4), p. 81, figs. 14, 15.

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 2 specimens, 135–140 mm.

*Hab.* Tropical West Africa.

## TRIGLIDAE

*Lepidotrigla cadmani*, Regan.

1915, *Ann. Mag. Nat. Hist.* (8) xv, p. 128.

St. 272. 30. vii. 27. Off Elephant Bay, Angola. Large otter trawl, 73–91 m.: 6 specimens, 125–240 mm.

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 16 specimens, 125–165 mm.

*Hab.* Off the coasts of Angola and French Congo.

This species was known previously only from the types, five specimens 130–170 mm. in total length, from Lagos.

BOTHIDAE<sup>1</sup>*Eucitharus linguatula* (Linn.).

Norman, 1930, *Discovery Reports*, 11, p. 359.

St. 272, St. 274, St. 279. Off Angola and French Congo. 9 specimens, 28–212 mm.

*Arnoglossus imperialis* (Rafin.).

Norman, 1930, *t.c.*, p. 360.

St. 272, St. 274, St. 279. Off Angola and French Congo. 3 specimens, 75–90 mm.

The following additional specimens have come to light since the publication of my previous report:

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Net (4 mm. mesh) attached to back of trawl, 64–65 m.: 3 specimens, 29–30 mm.

*Bothus podas* (Delaroche).

Norman, 1930, *t.c.*, p. 362.

St. 271, St. 299. Angola and Cape Verde Islands. 4 specimens, 38–73 mm.

<sup>1</sup> Some of the Heterosomata have been dealt with in a previous report. For the sake of completeness, the species are listed again here.

## SOLEIDAE

*Solea (Dicologlossa) chirophthalmus*, Regan.

Norman, 1930, *t.c.*, p. 363.

St. 274. Off Angola. 2 specimens, 145, 210 mm. 3 additional specimens, 245–255 mm., from the same locality.

## CYNOGLOSSIDAE

*Cynoglossus (Areliscus) lagoensis*, Regan.

1915, *Ann. Mag. Nat. Hist.* (8) xv, p. 129.

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Large otter trawl, 64–65 m.: 2 specimens, 455, 510 mm.

*Hab.* Coast of Angola.

*Symphurus nigrescens*, Rafin.

Norman, 1930, *t.c.*, p. 363.

St. 274, St. 279. Off Angola and French Congo.

The following additional specimen has come to light since the publication of my previous report:

St. 274. 4. viii. 27. Off St Paul de Loanda, Angola. Net (4 mm. mesh) attached to back of trawl, 64–65 m.: 1 specimen, 48 mm.

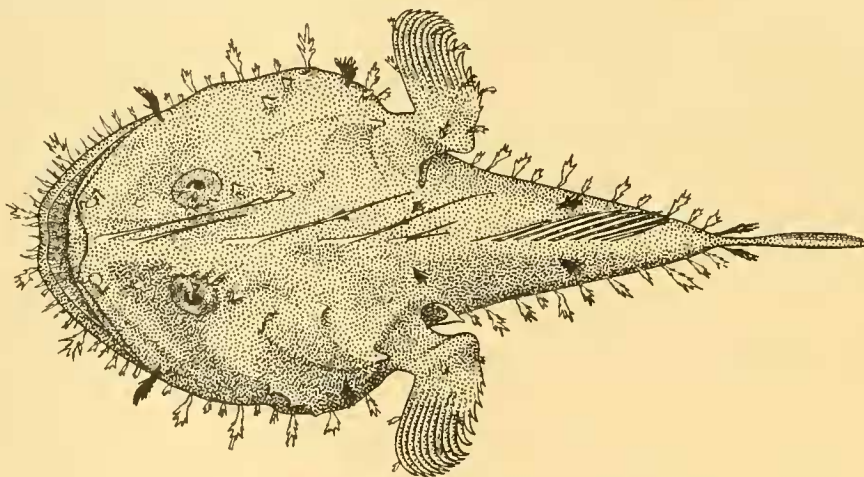


Fig. 12. *Chirolophius kempfi*. Holotype.  $\times \frac{3}{4}$ .

## LOPHIIDAE

*Chirolophius kempfi*, sp.n.

St. 279. 10. viii. 27. Off Cape Lopez, French Congo. Large otter trawl, 58–67 m.: 1 specimen (holotype), 140 mm.

Head nearly as broad as long, length (measured to lower angle of gill-opening) about  $\frac{1}{2}$  that of fish. Snout nearly twice diameter of eye, which is about 7 in length of head and a little less than interorbital width. Praemaxillaries with two series of depressible teeth anteriorly and one series of small fixed teeth laterally; teeth in lower jaw in about three series; two teeth on each side of vomer. A pair of obtuse divergent

spines on each side of the snout; each supraorbital ridge bearing 2 or 3 very blunt spines; humeral spine simple, truncate or rounded posteriorly. First ray of spinous dorsal more than  $\frac{1}{2}$  as long as head, reaching beyond base of third ray when laid back, with a complicated terminal flap; second ray broken off; third and fourth progressively shorter, with pairs of short lateral branches; fifth and sixth developed, connected by membrane basally. Soft dorsal with 8 rays, anal with 6, pectoral with 15 or 16. Greyish brown; lower surface of pectoral rays blackish.

This is the first species of the genus to be described from the Atlantic. Of the Indo-Pacific species it appears to approach most nearly to *C. moselyi*, Regan, from deep water north of New Guinea. I have much pleasure in naming this interesting fish after Dr Stanley Kemp, F.R.S., Director of Research of the Discovery Expedition.

### SOUTH AFRICA

About 170 specimens were obtained in South African waters, representing 54 species. A few of these were collected at St. 90 (Basin of H.M. Dockyard, Simon's Town, False Bay), from the 10th to the 12th of July, 1926, but the majority were obtained during the voyage made by Mr E. R. Gunther and Mr F. C. Fraser on the 'Richard Bennet' from the 6th to the 10th of July, 1927. A number of stations (A-Q) were made during this trip, and, in order to avoid needless repetition, the details of these stations are given below, only the letter referring to the particular station appearing under the different species. All the fishes were taken with the commercial otter trawl. Nearly all the species represented are to be found in Dr K. H. Barnard's excellent monograph on the Marine Fishes of South Africa,<sup>1</sup> and a reference to this work is given in each case.

#### Trawling stations of the Cape Trawler 'Richard Bennet'

- A. 6. vii. 27. 34° 00' S, 17° 58' E. 210-173 m.
- B. 7. vii. 27. 34° 2' S, 17° 41' E. 311 m.
- C. 7. vii. 27. 33° 58' S, 17° 44' E. 302 m.
- D. 7. vii. 27. 33° 53' S, 17° 38' E. 310 m.
- E. 7. vii. 27. 33° 57' S, 17° 29' E. 310-375 m.
- F. 8. vii. 27. 34° 6' S, 17° 42' E. 311 m.
- G. 8. vii. 27. 34° 2' S, 17° 44' E. 311-292 m.
- H. 8. vii. 27. 34° 4' S, 17° 36' E. 292-402 m.
- J. 8. vii. 27. 34° 8' S, 17° 33' E. 402-? 548 m.
- K. 9. vii. 27. 33° 48' 30" S, 17° 35' E. 274-301 m.
- L. 9. vii. 27. 33° 44' S, 17° 32' E. 301-311 m.
- M. 9. vii. 27. 33° 42' S, 17° 29' E. 311-402 m.
- N. 9. vii. 27. 33° 48' S, 17° 29' 30" E. 402-235 m.
- O. 10. vii. 27. 33° 48' S, 17° 30' E. 329 m.
- P. 10. vii. 27. 33° 42' S, 17° 32' E. 329 m.
- Q. 10. vii. 27. 30° 47' S, 17° 33' E. 311 m.

<sup>1</sup> 1925-7, *Ann. S. Afr. Mus.*, xx1, 1065 pp., 37 pls., text-figs.

## MYXINIDAE

*Eptatretus hexatrema* (Müller).

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 16.

St. 90. 10–11. vii. 26. Large gauze fish-trap, 10 m.: 2 specimens, 460, 610 mm.

## SCYLIIORHINIDAE

*Scyliorhinus* (*Scyliorhinus*) *capensis* (Müll. and Henle).

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 40.

St. B. 1 female specimen, 570 mm.

*Scyliorhinus* (*Halaelurus*) *regani*, Gilchrist.

Barnard, *t.c.*, p. 42.

St. A. 1 male specimen, 540 mm.

This species, which was not previously represented in the British Museum collection, appears to be most nearly related to *S. natalensis*, Regan, and *S. polystigma*, Regan.

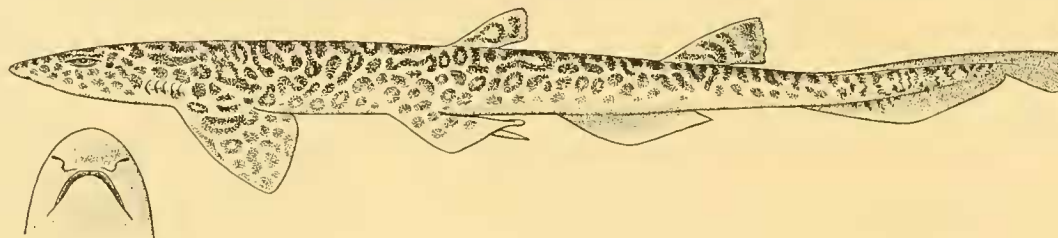


Fig. 13. *Scyliorhinus* (*Halaelurus*) *regani*.  $\times \frac{1}{4}$ .

*Scyliorhinus* (*Apristurus*) *saldanha*, Barnard.

Barnard, *t.c.*, p. 44.

St. J. 1 male specimen, 430 mm., 2 females, 385, 415 mm.

These specimens agree fairly well with Barnard's description of *S. saldanha*. This species is apparently very close to *S. profundorum*, Goode and Bean, from the North Atlantic, and *S. indicus*, Brauer, from the Indian Ocean.

## CARCHARINIDAE

*Mustelus canis* (Mitchill).

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 30.

St. D. 1 young female specimen, 290 mm. (removed from a specimen, 1010 mm. long).

## SQUALIDAE

*Squalus acanthias*, Linn.

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 47.

St. D. 3 embryos with yolk-sacs, 175–195 mm.



**Squalus acutipinnis**, Regan.

Barnard, *t.c.*, p. 48.

St. A. 1 male specimen, 410 mm.; 1 female, 415 mm.

St. O. 1 male specimen, 665 mm.; 1 female, 575 mm.

**Spinax spinax** (Linn.).

*Etmopterus spinax*, Barnard, *t.c.*, p. 49.

St. J. 2 male specimens, 330, 335 mm.

**Spinax granulosus**, Günth.

*Etmopterus granulosus*, Barnard, *t.c.*, p. 49, pl. ii, fig. 8.

St. J. 2 male specimens, 345, 370 mm.

**Spinax lucifer** (Jordan and Snyder).

*Etmopterus lucifer*, Barnard, *t.c.*, p. 50.

St. J. 1 male specimen, 410 mm.

## TORPEDINIDAE

**Narcobatus nobilianus** (Bonap.).

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 89.

St. ?. 2 female specimens, 440, 500 mm.

## RAJIDAE

**Raja alba**, Lacep.

*Raia marginata*, Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 65, pl. iv, fig. 1.

St. ?. 1 female specimen, 605 mm. (width of disc 465 mm.).

**Raja smithi**, Müll. and Henle.

Barnard, *t.c.*, p. 66, pl. iv, fig. 4.

St. N. 1 female specimen, 210 mm. (width of disc 150 mm.).

**Raja barnardi**, sp.n.

St. A. 1 immature male specimen, 375 mm. (width of disc 210 mm.).

See description below.

**Raja caudaspinosa**, Von Bonde and Swart.

St. J. 2 young female specimens, 200, 220 mm. (width of disc 100, 105 mm.).

St. N. 1 immature female specimen, 485 mm. (width of disc 270 mm.).

**Raja leopardus**, Von Bonde and Swart.

St. J. 1 young male specimen, 175 mm. (width of disc 95 mm.); 1 young female, 135 mm. (width of disc 75 mm.).

REVISION OF THE SOUTH AFRICAN SPECIES OF THE GENUS *RAJA*

The difficulty of identifying the specimens of this genus obtained by the S.T. 'Richard Bennet' led me to suggest to Dr K. H. Barnard of the South African Museum that it might be of interest to revise our knowledge of the South African species of *Raja*. Several European rays have been recorded from the Cape, but in very few cases

has an actual comparison of specimens from the two regions been made. In addition, Dr C. von Bonde and Mr D. B. Swart have published a report upon the skates and rays collected by the S.S. 'Pickle', in which five new species of the genus *Raja* are described. Unfortunately, nearly all these species are based upon very small specimens, and no indication is given by the authors as to their relationships with previously known forms. The description of new species of this genus upon the basis of young individuals only is to be regretted, as these fishes change considerably with age, and until a complete series of stages becomes available it is quite impossible to refer such species to their correct place in the system.

Through the kindness of Dr von Bonde I have been able to examine type material of *R. parcomaculata*, *R. albalinea*, and *R. leopardus*, now preserved in the collection of the Government Marine Survey of South Africa: the types of *R. caudaspinosa* and *R. durbanensis*, said to be in the same collection, cannot unfortunately be found. Dr Barnard has been good enough to send to the British Museum as a loan all the specimens of *Raja* in the collection of the South African Museum, including three stuffed examples exhibited in the public galleries, as well as the type of *R. spinacidermis*. For this courtesy, and for the kindly interest that he has shown in this revision, I take this opportunity of offering my warmest thanks.

The arrangement of the species adopted here still remains more or less tentative, and further material of most species, including as far as possible examples of all stages of both sexes, will be required before it will be possible to arrive at any definite conclusions concerning the South African members of this difficult genus.

### Key to the South African Species

- I. Terminal parts of lateral line tubules on lower surface pigmented, appearing as small blackish spots and streaks; only one enlarged spine on back in adult; anterior margins of disc emarginate; vent nearer end of tail than tip of snout; length of snout about  $4\frac{1}{3}$  in width of disc. *batis*.
- II. No pigment spots or streaks on lower surface; vent about equidistant from tip of snout and end of tail or nearer the former; length of snout  $4\frac{1}{2}$  to more than 6 in width of disc.
  - A. Disc never completely spinulose; eye + spiracle  $1\frac{2}{3}$  to nearly 3 in length of snout.
    1. Never more than one row of spines along middle of disc.
      - a. Snout abruptly narrowed into a long sharp point; upper surface of disc quite smooth; 40 to 46 rows of teeth ... .. *alba*.
      - b. Snout not abruptly narrowed; upper surface of disc more or less spinulose in parts.
        - $\alpha$ . Large buckler-like spines often present in mature females, mostly absent in males; 36 to 44 rows of teeth; tail with 1 (males) or 3 to 5 (females) rows of enlarged spines ... .. *rhizacanthus*.
        - $\beta$ . No large buckler-like spines in either sex.
          - \* Width of disc  $\frac{2}{3}$  to  $\frac{4}{6}$  of total length of fish; eye + spiracle 2 to  $2\frac{1}{6}$  in length of snout, which is  $5\frac{1}{4}$  to 6 in width of disc.
            - † 26 to 28 rows of teeth; tail with only one row of enlarged spines in both sexes; no ocelli on pectoral fins ... .. *smithi*.

†† 44 to 50 rows of teeth; tail with 3 to 5 rows of enlarged spines in both sexes; a rounded ocellus on each pectoral fin ... .. *ocellifera*.

\*\* Width of disc scarcely  $\frac{3}{5}$  of total length of fish; eye + spiracle  $2\frac{2}{3}$  in length of snout, which is  $4\frac{1}{2}$  in width of disc; 40 to 42 rows of teeth ... .. *barnardi*.

2. 3 or more rows of spines along middle of disc (except in young); usually a triangular patch of enlarged spines on the shoulder; width of disc about  $\frac{3}{5}$  of total length of fish.

a. 32 to 42 rows of teeth; interorbital width less than longitudinal diameter of eye; eye + spiracle  $1\frac{2}{3}$  in length of snout ... .. *caudaspinosa*.

b. 50 to 80 rows of teeth; interorbital width equal to or greater than longitudinal diameter of eye; eye + spiracle 2 to  $2\frac{3}{4}$  in length of snout ... .. *leopardus*.

B. Upper surface of disc completely covered with close-set, fine, setiform spinules; no enlarged spines (except in young); eye + spiracle  $3\frac{1}{2}$  in length of snout; 60 rows of teeth (in adult) *spinacidermis*.

### **Raja batis**, Linnaeus.

1758, *Syst. Nat.*, ed. 10, p. 231; Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 70, pl. iv, fig. 3; Clark, 1926, *Fisheries, Scotland, Sci. Invest.*, 1926, 1, p. 50, pls. xxxi, fig. b, xxxii, xxxiii, figs. a and b.

*Raia stabuliforis*, von Bonde and Swart, 1923, *Rep. Fish. Mar. Biol. Surv. S. Afric.*, 111 (1922), Spec. Rep. v, p. 12.

Disc broader than long, its width about  $\frac{2}{3}$  of the total length; anterior margins more or less undulated and deeply emarginate; outer angles nearly rectangular. Vent rather nearer to end of tail than to tip of snout. Snout acutely pointed, its length about  $4\frac{1}{3}$  in width of disc. Interorbital width less than diameter of eye + spiracle, which is about  $2\frac{3}{4}$  in length of snout. Internasal width about  $2\frac{1}{2}$  in praeoral length of snout. Teeth more or less flat; about 52 rows. Upper surface mainly smooth, but with some small scattered spinules, chiefly on snout, anterior margins of pectorals and middle of back; 2 or 3 praeocular and 1 or 2 postocular spines; a single large nuchal spine; tail with a median series of about 21 strong spines, alternately larger and smaller, and with an irregular series of 4 or 5 spines on each side; 3 spines between the dorsal fins. Lower surface rough on snout, but otherwise smooth. Upper surface brownish, with a few irregularly arranged darker spots; lower surface greyish; terminal parts of lateral line tubules pigmented, appearing as small blackish spots and streaks.

*Hab.* Coasts of Europe, from Iceland and Scandinavia to Madeira; Mediterranean (?); South Africa.

Described from a single mounted female specimen, 680 mm. in total length (480 mm. across disc), from off Cape Point, 100 fathoms.

It is possible that the South African form described here will eventually prove to be distinct from the European *R. batis*, but, as I have only seen a single stuffed example, I have hesitated to separate the two at present. Comparison with a European example of similar size suggests that the South African form may have a narrower interorbital region and perhaps a larger eye, but since artificial eyes have been inserted in the specimen accurate measurements are impossible. The arrangement of the spines on the tail appears to be different, the disc is rather more spinulose, and the enlarged nuchal spine has no counterpart in *R. batis* from Europe.



**Raja alba**, Lacepède.

1803, *Hist. Nat. Poiss.*, v, p. 661, pl. xx, fig. 1; von Bonde and Swart, 1923, *t.c.*, p. 5.

*Raja marginata*, Lacepède, 1803, *t.c.*, p. 662, pl. xx, fig. 2; Regan, 1908, *Ann. Natal Mus.*, 1, p. 242; Barnard, 1925, *t.c.*, p. 65, pl. iv, fig. 1; Clark, 1926, *t.c.*, p. 47, pls. xxviii, xxix, xxx figs. *a* and *b*, xxxi fig. *a*.

Disc broader than long, its width about  $\frac{4}{5}$  of the total length; anterior margins undulated; outer angles pointed. Vent about equidistant from tip of snout and end of tail. Snout abruptly narrowed into a long sharp point, its length  $4\frac{2}{3}$  to  $5\frac{3}{4}$  in width of disc. Interorbital width about equal to diameter of eye + spiracle, which is 2 (young) to nearly 3 in length of snout. Internasal width  $1\frac{2}{5}$  (young) to 2 in preacoral length of snout. Teeth with long conical points in the middle of the jaws, more obtuse and with short points laterally; 40 to 46 rows. Upper surface quite smooth; one preocular and generally one postocular spine; no nuchal or scapular spines, and no median spines on disc; tail with a median series of 11 to 18 spines, extending forward to posterior end of base of pelvic, and with a lateral series on each side. Lower surface with small spines on the snout and along the anterior edges of the pectorals. Upper surface uniformly brownish or more or less spotted with white; lower surface white, the tail and margins of pectorals and pelvics often brownish or blackish, especially in the young.

*Hab.* Coasts of Europe, from the English Channel to the Mediterranean; coasts of northern and north-western Africa; South Africa.

Described from 12 specimens, 270–605 mm. in total length (205–465 mm. across disc), from Kalk Bay, Simonstown, Agulhas Bank, Cape St Blaize, and off Bird Island, Natal.

Comparison of South African with European material shows that as a general rule the snout is a little longer in examples from Europe, but this character appears to be subject to considerable variation and I am unable to detect any other differences of importance. Clark has shown that Lacepède's young black-bordered *R. marginata* is identical with the white-bellied adult, *R. alba*, described by the same author. In accordance with Article 28 of the International Rules, the name *alba* (p. 661) takes precedence of *marginata* (p. 662).

**Raja rhizacanthus**, Regan.

*Raja capensis* (non Gmelin), Müller and Henle, 1841, *Plagiost.*, p. 151; Duméril, 1865, *Hist. Nat. Poiss.*, 1, p. 540, pl. xii, figs. 11 and 12; Sauvage, 1891, *Hist. Nat. Poiss. Madagascar*, p. 1; von Bonde and Swart, 1923, *t.c.*, p. 4.

? *Raja capensis*, Kner, 1869, *Reise 'Novara'*, Zool. 1, 5. Fische, p. 419.

*Raia rhizacanthus*, Regan, 1906, *Ann. Natal Mus.*, 1, p. 3, pl. iii.

*Raia clavata*, Barnard, 1925, *t.c.*, p. 64, pl. iv, fig. 2.

Disc broader than long, its width  $\frac{2}{3}$  to  $\frac{5}{6}$  of the total length; anterior margins more or less undulated; outer angles pointed. Vent equidistant from tip of snout and end of tail or a little nearer to the former. Snout with a short, obtuse, triangular projection, its length  $5\frac{1}{4}$  to more than 6 in width of disc. Interorbital width equal to or rather greater than (a little less than in young) diameter of eye + spiracle, which is  $2\frac{1}{3}$  to

about  $2\frac{3}{5}$  in length of snout. Internasal width  $1\frac{1}{2}$  to  $1\frac{2}{3}$  in preoral length of snout. Teeth pointed in males, at least in middle of jaws, blunt in females; 36 to 44 rows (fewer in young). Upper surface of disc and tail in young with small scattered spines, chiefly confined to the snout, interorbital region, anterior parts of pectorals and the sides of the tail; in adults the disc and tail are more or less covered with small spinules; mature females sometimes with large round "bucklers" bearing claw-like spines scattered irregularly over the upper and lower surfaces, which are nearly always absent in males; 2 preocular and 3 postocular spines in the young, the numbers being reduced or the spines disappearing altogether in the adults; young with a pair of scapular spines, disappearing in the adults; a median series of 27 to 45 spines, extending anteriorly to beyond the scapular region in the young, but scarcely beyond the pelvic region in adults; tail in females with one or two lateral series of spines. Lower surface smooth in the young, but adults with some small spines, especially on the snout. Brownish or greyish, with or without darker and paler markings; young generally with a dark ocellated spot, sometimes circular, sometimes oblong, near the middle of the base of each pectoral; lower surface pale, occasionally with some dark patches.

*Hab.* South Africa, from Walfish Bay to the coast of Natal; Madagascar.

Described from 13 specimens, 135–840 mm. in total length (90–620 mm. across disc), from Kalk Bay, False Bay, Agulhas Bank, off Cape St Blaize, and off Bird Island, Natal.

This species is closely related to *R. clavata*, the thornback ray of European seas, but the two appear to be distinct. In *R. clavata* the upper surface is entirely spinulose, even in the newly hatched young, whereas in the African species the adults are never completely covered with spinules. Comparison of specimens of equal size shows that in *R. clavata* the spinules are always more closely set. Further, in *R. clavata* the tail is constantly rather longer, the vent being distinctly nearer to the tip of the snout than to the end of the tail, and there is a difference in the shape of the snout.

The four large specimens from near Cape St Blaize and west of Cape Point, sent to the British Museum in 1900 by Dr Gilchrist, and identified by Dr G. A. Boulenger as *R. batis*, prove to belong to this species.

*Raja smithi*, Müller and Henle.

1841, *Plagiost.*, p. 150, pl. xlix, fig. 1; Barnard, 1925, *t.c.*, p. 66, pl. iv, fig. 4.

Disc broader than long, its width  $\frac{2}{3}$  to  $\frac{3}{4}$  of the total length; anterior margins a little undulated; outer angles obtusely pointed. Vent nearly equidistant from tip of snout and end of tail. Snout a little produced, its length  $5\frac{2}{5}$  to  $5\frac{2}{3}$  in width of disc. Interorbital width equal to or a little less than diameter of eye + spiracle, which is 2 to about  $2\frac{3}{5}$  in length of snout. Internasal width  $1\frac{1}{2}$  to  $1\frac{2}{3}$  in preoral length of snout. Teeth rather widely spaced, those in the middle of the jaws pointed in both sexes; 26 to 28 rows. Upper surface with small four- or five-rooted spinules on snout, interorbital region, anterior, posterior and outer parts of pectorals, and on the middle of the back, the last being more numerous in adults; no enlarged ocular spines; young with 14 to 16 median spines on the tail, and adults with 4 or 5 additional median spines on the

back behind the nuchal region; sides of tail with several series of very small spinules. Lower surface quite smooth. Upper surface more or less uniformly brownish or greyish; lower surface white, sometimes with irregular black blotches and with black margins to the posterior part of the disc; lower surface of tail black.

*Hab.* South Africa.

Described from 3 specimens, 210–520 mm. in total length (150–330 mm. across disc), including the type of the species (a dried skin).

Barnard regards *R. eatoni*, Günther, from Kerguelen Island, as a local variety of *R. smithi*, but, although the two species are clearly related, they seem to be distinct. *R. eatoni* has a longer and more pointed snout and there are obvious differences in the spination.

### *Raja ocellifera*, Regan.

1906, *Ann. Natal Mus.*, 1, p. 2, pl. ii; 1908, *t.c.*, p. 242; Barnard, 1925, *t.c.*, p. 67.

Disc broader than long, its width  $\frac{2}{3}$  to  $\frac{4}{5}$  of the total length; anterior margins more or less undulated; outer angles rounded or obtusely pointed. Vent a little nearer to tip of snout than to end of tail. Snout with a short, obtuse, triangular projection, its length  $5\frac{1}{4}$  (young) to 6 in width of disc. Interorbital width greater than diameter of eye, but less than that of eye + spiracle, which is 2 (young) to  $2\frac{2}{5}$  in length of snout. Internasal width  $1\frac{1}{3}$  to  $1\frac{2}{3}$  in praeoral length of snout. Teeth with sharp points in males (but often much worn), more or less obtuse in females; 44 to 50 rows. Upper surface of disc and tail smooth, except for a few small spinules on tip of snout, on rostral ridges, and on anterior margins of pectorals, these spinules stronger in males; 2 to 4 praeocular and 2 or 3 postocular spines; usually 1 to 3 median nuchal spines; young with a pair of scapular spines; a median series of spines commencing on posterior part of body and extending on to tail, commencing further forward in females than in males; in young of both sexes the series commences immediately behind the suprascapular region; tail with one or two series of spines on each side. Lower surface quite smooth. Upper surface brownish, with or without small darker spots; a large bluish-black, white-edged ocellus near the middle of the base of each pectoral; lower surface uniformly pale.

*Hab.* South Africa, from False Bay to Natal.

Described from 12 specimens, 125–490 mm. in total length (88–340 mm. across disc), from False Bay, Agulhas Bank, off Cape St Blaize, Algoa Bay, and the coast of Natal, including the types of the species.

This species is closely related to *R. miraletus* from the Mediterranean and the west coast of Africa, which has, however, a somewhat longer tail, a longer snout ( $4\frac{1}{2}$  to  $5\frac{1}{4}$  in width of disc and  $2\frac{1}{3}$  to  $2\frac{2}{3}$  times eye + spiracle), narrower interorbital region (equal to or less than, only occasionally greater than, diameter of eye), and there are only 38 to 42 rows of teeth. In *R. miraletus* the ocellus is nearly circular, whereas, in *R. ocellifera* this tends to be horizontally ovate. In some respects the two specimens obtained by the 'Discovery' off the coast of Angola approach the African form, but should, I think, be referred to *R. miraletus*.



The specimens from near Cape St Blaize, sent to the British Museum in 1900 by Dr Gilchrist, and identified by Dr Boulenger as *R. miraletus*, prove to belong to *R. ocellifera*.

***Raja barnardi*, sp.n.**

Disc a little broader than long, its width scarcely  $\frac{3}{5}$  of the total length; anterior margins a little undulated; outer angles smoothly rounded. Vent a little nearer to tip of snout than to end of tail. Snout with a rather short, obtuse, triangular projection, its length  $4\frac{1}{2}$  in width of disc. Interorbital width about equal to diameter of eye; eye + spiracle  $2\frac{2}{3}$  in length of snout. Internasal width  $2\frac{1}{3}$  in praeoral length of snout. Teeth more or less pointed in middle of jaws; 40 to 42 rows. Upper surface of disc and tail mainly smooth, but a large patch of spinules on anterior part of each pectoral, and some scattered spinules on snout, interorbital region, middle of back and hinder parts of pectorals; 2 praeocular and 4 postocular spines; 3 median nuchal spines, with a smaller one on each side; a single median spine above the suprascapular region; 2 scapular spines; a series of 24 median spines extending from just behind the suprascapular region to the first dorsal; anterior part of tail with a somewhat irregular series of spines on each side; edges of tail with numerous small spinules. Lower surface quite smooth except at edges of snout. Upper surface brownish, with traces of small pale spots; lower surface uniformly pale.

*Hab.* Off Cape Town.

Fig. 14. *Raja barnardi*. Holotype.  $\times \frac{1}{3}$ .

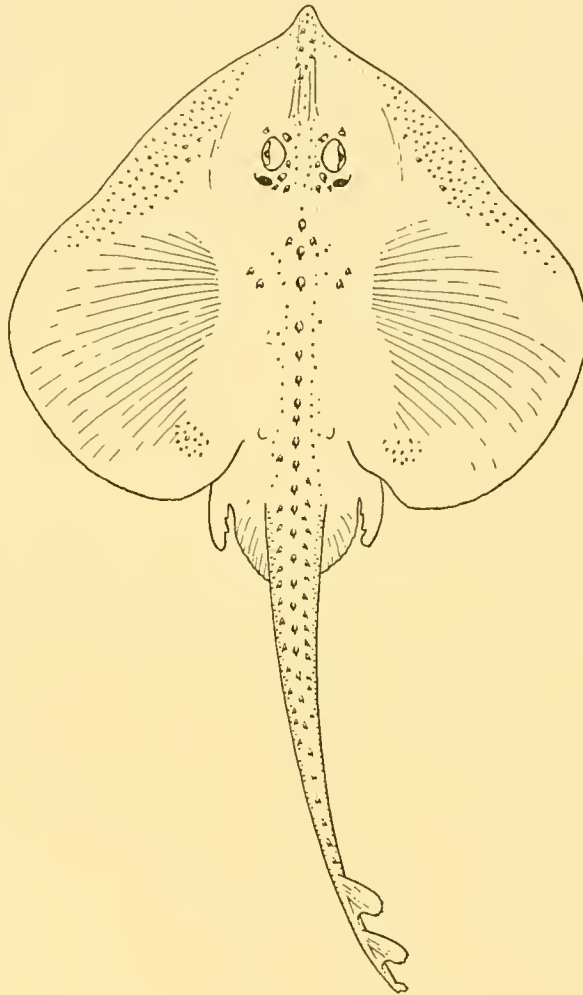
Described from a single male specimen, 375 mm. in total length (210 mm. across disc), from  $34^{\circ}$  S,  $17^{\circ} 58'$  E, at a depth of 210–173 m.; obtained by the Discovery Expedition.

***Raja caudaspinosa*, von Bonde and Swart.**

? *Raia albalinea*, von Bonde and Swart, 1923, *t.c.*, p. 6, pl. xx, fig. 1.

*Raia caudaspinosa*, von Bonde and Swart, 1923, *t.c.*, p. 8, pl. xxi, fig. 1; Barnard, 1925, *t.c.*, p. 66.

Disc rather broader than long, its width about  $\frac{3}{5}$  of the total length; anterior margins a little undulated; outer angles obtusely pointed. Vent much nearer to tip of snout



than to end of tail. Snout with a very small and obtuse projection, its length 6 in width of disc. Interorbital width less than diameter of eye; eye + spiracle  $1\frac{2}{3}$  in length of snout. Internasal width  $2\frac{1}{4}$  in praeoral length of snout. Teeth mostly flat, but some in middle of jaws more or less bluntly pointed; (32 to 36) 40 to 42 rows. Upper surface of disc mainly smooth, but a large patch of stellate-based spinules on anterior part of each pectoral; a group of spines on the snout; a series of 9 spines above each orbit and spiracle, and a pair between the spiracles; 2 median nuchal spines and a pair of scapular spines; a series of median spines extending from just behind the suprascapular region to the first dorsal, and a lateral series of smaller spines on each side; on the tail there is an additional series at each edge, making 5 rows in this region. Lower surface quite smooth. Upper surface more or less uniformly brownish grey.

*Hab.* South Africa, from off Cape Town to the coast of Natal.

Described from a single female specimen, 485 mm. in total length (270 mm. across disc), from  $33^{\circ} 48' S$ ,  $17^{\circ} 29' E$ , at a depth of 402–235 m.; obtained by the Discovery Expedition. The unique holotype was a female, 346 mm. in total length (172 mm. across disc).

It seems probable that *R. albalinea* represents the young of the species described above, but in the absence of examples of intermediate size it is impossible to confirm this. The following description of the young stages is based upon the very small type of *R. albalinea* (110 mm.) and two somewhat larger examples (200, 220 mm.) obtained by the Discovery Expedition: Disc subcircular, its width about  $\frac{1}{2}$  the total length; anterior margins very little undulated. Length of snout about 6 in width of disc. Interorbital width equal to or rather less than diameter of eye; eye + spiracle  $1\frac{1}{4}$  to about  $1\frac{1}{2}$  in length of snout, 30 to 34 rows of teeth. Upper surface of disc more or less covered with scattered spinules in the smallest example, but in the larger these tend to be more strongly developed on the anterior parts of the pectorals; 2 praeocular and 2 or 3 postocular spines; 2 or 3 median nuchal spines and 2 or 3 scapular spines; a median series of 22 to 27 strong spines extending from just behind the suprascapular region to the first dorsal; in the type this series is continuous with the nuchal spines; in one of the larger specimens there are 2 or 3 spines on each side of the median row on the disc; tail with several series of spinules laterally, those at edge larger. Lower surface quite smooth. Upper surface pale brownish grey, with some rather indistinct and nearly horizontal white lines near the edges of the pectoral fins.

Described from 3 specimens, 110–220 mm. in total length (55–105 mm. across disc).

**Raja leopardus**, von Bonde and Swart.

*Raia quadrimaculata* (*non* Risso), von Bonde and Swart, 1923, *t.c.*, p. 5; Barnard, 1925, *t.c.*, p. 70, pl. iv, fig. 5.

*Raia leopardus*, von Bonde and Swart, 1923, *t.c.*, p. 7, pl. xx, fig. 2; Barnard, 1925, *t.c.*, p. 74.

*Raia lintea*, Barnard, 1925, *t.c.*, p. 72.

*Raia naevus*, Barnard, 1925, *t.c.*, p. 72.

Disc broader than long, its width about  $\frac{3}{5}$  of the total length; anterior margins more or less undulated, except in young, deeply notched in adult males; outer angles broadly

rounded. Vent a little nearer to tip of snout than to end of tail. Snout with a rather short, obtuse, triangular projection, its length  $4\frac{1}{2}$  to more than 6 in width of disc. Interorbital width equal to (young) or greater than diameter of eye, but always less than that of eye + spiracle, which is 2 to  $2\frac{3}{4}$  in length of snout. Internasal width  $1\frac{2}{3}$  to  $2\frac{1}{3}$  in preoral length of snout. Teeth pointed in mature individuals of both sexes, but often worn quite flat; 50 to 80 rows. Upper surface of disc and tail mainly smooth, but with some scattered small, often stellate-based spinules, chiefly on snout, anterior parts of pectorals and sides of tail; larger spines all with stellate bases; a series of spines above each orbit and spiracle, and a pair between the spiracles; young with 2 to 4 median nuchal spines, and 2 or 3 scapular spines; in adults there is a triangular patch of spines on the nucho-scapular region; young with a series of 25 to 27 median spines extending from just behind the suprascapular region to the first dorsal; these are gradually reduced during growth, being represented by rather obtuse spines in a mature male, and are absent altogether in large females; 1 or 2 lateral series on each side of the median line of the back (except in young), persisting in the largest specimens in which the median series has disappeared, and 2 series, with some irregularly arranged additional spines, on each side of the tail. Lower surface rough on snout and (in adults) the anterior edges of the pectorals; otherwise smooth. Upper surface brownish or greyish, sometimes with numerous round dark spots, chiefly obvious in the young; sometimes traces of pale, dark-edged ocelli, and occasionally a very faint *naevus*-like ocellus near the middle of the base of each pectoral; lower surface uniformly pale or with some irregularly shaped but more or less symmetrically arranged greyish or blackish patches on pectorals and pelvics.

*Hab.* South-western Africa, off Cape Peninsula and Saldanha Bay; coast of Natal.

Described from 14 specimens, 110–975 mm. in total length (58–625 mm. across disc), from off Dassen Island, Table Bay and Cape Point, and from the coast of Natal, including the types of the species.

I have little doubt, after examining all the available material, that the forms described by Barnard as *quadrimaculata* and *naevus* represent the same species, the description of the former being based upon very large female specimens. The types of *R. leopardus* are both very small (110, 180 mm. in total length; 58, 95 mm. across disc), but are almost certainly the young of the species described above. The mounted specimen, 740 mm. in total length (485 mm. across disc), identified by Barnard as *R. lintea*, appears to belong to this species.

This species has been confused with *R. naevus* of European seas, but the two are quite distinct. In *naevus* the snout is rather shorter and blunter, its length 5 (young) to about  $6\frac{1}{2}$  in width of disc; the interorbital width is equal to or rather less than diameter of eye; and there are only 54 to 60 rows of teeth. Further, comparison of specimens of similar size shows the spination to be different, the small spinules being much more numerous and better developed in the European species. Also, *R. leopardus* lacks the large ocellus which is so characteristic of *R. naevus*.



**Raja spinacidermis**, Barnard.

*Raia spinacidermis*, Barnard, 1923, *Ann. S. Afr. Mus.*, XIII, p. 440; Barnard, 1925, *t.c.*, p. 73, pl. iv, fig. 6.

? *Raia durbanensis*, von Bonde and Swart, 1923, *t.c.*, p. 11, pl. xxii, fig. 1; Barnard, 1925, *t.c.*, p. 69.

? *Raia plutonia*, Barnard, 1925, *t.c.*, p. 68.

Disc broader than long, its width about  $\frac{5}{6}$  of the total length; anterior margins scarcely undulated; outer angles broadly rounded. Vent very little nearer to tip of snout than to end of tail. Snout pointed but not produced, its length  $4\frac{3}{4}$  in width of disc. Interorbital width a little greater than diameter of eye + spiracle, which is  $3\frac{1}{2}$  in length of snout. Internasal width 2 in praeoral length of snout. Teeth in middle of jaws slightly pointed; 60 rows. Upper surface of disc and tail wholly covered with closely-set, fine, setiform spinules, which are larger and closer together on the tail than elsewhere; no enlarged spines. Lower surface of disc smooth; tail, except the median line of the basal part, spinulated like the upper surface. Upper surface pale slaty grey, becoming a little darker towards the hinder margins of the pectorals and distinctly darker on pelvics; lower surface similarly and as deeply coloured as upper surface.

*Hab.* South Africa.

Described from the single type specimen, a female, 600 mm. in total length (510 mm. across disc), believed to be from off Cape Point in deep water.

This species appears to be most nearly related to the European shagreen ray, *R. fullonica*, Linnaeus.

It seems probable that the two very young specimens, 120 and 190 mm. in total length (68 and 100 mm. across disc), from south of the Agulhas Bank and from off Cape Point, identified by Barnard as *R. plutonia*, belong here. In the smaller of these there is a median series of spines on the disc and tail, but these are already disappearing in the larger specimen: there are also some spines above the orbits and spiracles, and one or two pairs of scapular spines.

**DOUBTFUL SPECIES****Raja montagui**, Fowler (= *R. maculata*, Montagu *nec* Shaw).

*Raia maculata*, Barnard, 1925, *t.c.*, p. 71.

This species has been recorded by Bleeker (1860) and Pappe (1866), but it is probable that the true *montagui* does not occur in South Africa and that their specimens should be referred to some other species.

**Raja parcomaculata**, von Bonde and Swart.

1923, *t.c.*, p. 9, pl. xxi, fig. 2.

The type specimen from Natal examined by me is only 181 mm. in total length (60 mm. across disc).

## CHIMAERIDAE

*Chimaera africana*, Gilchrist.

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 95.

St. ?. 1 female specimen, 625 mm.

This species is well distinguished from *C. monstrosa*, Linn., by the absence of a distinct anal fin, as well as by the shorter pectoral fins, black coloration, etc. The lateral line in the present specimen is distinctly sinuous, and not straight as described by Barnard. Further, with regard to the cephalic branches of the lateral line, on one side of the head the opercular and malar branches arise together from the suborbital, whereas, on the other side they are united to form a common branch for a very short distance. It is not unlikely that *C. africana* will eventually prove to be identical with *C. affinis*, Capello (= *C. plumbea*, Gill, and *C. abbreviata*, Gill), which has been described from large specimens taken on both sides of the Atlantic. The caudal filament perhaps becomes shorter with age.

## ARIIDAE

*Galeichthys feliceps*, Cuv. and Val.

Boulenger, 1911, *Cat. Fresh-water Fish. Africa*, II, p. 381, fig. 295.

29. vii. 27. Simon's Town. 1 specimen, 150 mm.

Found while draining the dry dock.

## CONGRIDAE

*Congermuraena albescens*, Barnard.

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 189, pl. ix, fig. 1.

St. E. 1 specimen, 725 mm.

## SCOMBRESOCIDAE

*Scombresox saurus* (Walbaum).

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 259, fig. 16.

St. K. 1 specimen, 355 mm. (from the stomach of *Merluccius capensis*).

## MACRORHAMPHOSIDAE

*Notopogon macrosolen*, Barnard.

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 279, pl. xi, fig. 3.

St. G. 1 specimen, 220 mm.

St. M. 1 specimen, 250 mm.

St. O. 1 specimen, 263 mm.

## MACRURIDAE

*Coryphaenoides* (Paramacrurus) *fasciatus* (Günther).

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 340.

St. A. 6 specimens, 260–345 mm.

St. B. and H. 4 specimens, 130–240 mm.

St. J. 9 specimens, 390–650 mm.

**Coryphaenoides (Oxygadus) braueri**, Barnard.

Barnard, *t.c.*, p. 342, pl. xiii, fig. 5.

St. J. 12 specimens, 220–405 mm. (the largest example has the tail broken).

**Malacocephalus laevis** (Lowe).

Barnard, *t.c.*, p. 344.

St. B. 4 specimens, 510–660 mm. (three of the examples have the tail damaged).

**Lionurus leonis**, Barnard.

Barnard, *t.c.*, p. 349, pl. xiii, fig. 6.

St. O. 1 specimen, 360 mm.

**Lionurus** sp.

St. J. 1 specimen, 245 mm.

## MERLUCCIIDAE

**Merluccius capensis**, Casteln.

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 320, pl. xii, fig. 5.

St. B. 1 specimen, 173 mm.

St. C. 3 specimens, 405–530 mm.

St. P. 5 specimens, 640–850 mm.

Barnard notes that "there still seems room for doubt as to whether the Cape Hake is really distinct from the northern Atlantic *M. vulgaris*". I have carefully compared examples of both species, and find that, in addition to the somewhat larger scales, the Cape form may be readily distinguished by the larger eye, greater number of gill-rakers (13 or 14 instead of 7 or 8), and longer pectoral fin.

## GADIDAE

**Lepidion capensis**, Gilchrist.

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 324, pl. xiii, fig. 1.

St. J. 6 specimens, 310–500 mm.

**Lepidion natalensis**, Gilchrist.

Barnard, *t.c.*, p. 324.

St. J. 1 specimen, 408 mm.

A SYNOPSIS OF THE SPECIES OF *LEPIDION*

In order to satisfy myself as to the systematic position and nomenclature of the two species found at the Cape, I have been led to examine all the specimens of this genus in the British Museum collection, and have prepared a brief synopsis of the group.

Genus *Lepidion*<sup>1</sup>

*Lepidion*, Swainson, 1838, *N.H. Fishes etc.*, 1, p. 318. Type *Gadus lepidion*, Risso.

*Haloporphyrus*, Günther, 1862, *Cat. Fish.*, 1v, p. 358. Type *Gadus lepidion*, Risso.

<sup>1</sup> According to the International Rules, this is not invalidated by *Lepidia*, Savigny—a genus of worms.



Key to the Species<sup>1</sup>

- I. Snout  $1\frac{1}{2}$  to  $1\frac{2}{3}$  times eye, which is  $4\frac{3}{4}$  to  $5\frac{1}{2}$  in head; barbel longer than eye.
- A. Depth 4 to  $4\frac{1}{4}$  in length; pectoral about  $1\frac{5}{8}$  in head.
1. Dorsal 4 + 52–56; 15 or 16 scales between first dorsal fin and lateral line ... *guentheri*.
  2. Dorsal 4 + 60; about 18 scales between first dorsal fin and lateral line ... *oidema*.
- B. Depth more than 5 in length; pectoral about  $1\frac{1}{2}$  in head; dorsal and anal with deep black margins, the black area covering greater part of fin posteriorly ... *natalensis*.
- II. Snout as long as or shorter than eye, which is  $2\frac{3}{4}$  to  $3\frac{3}{4}$  in head; barbel generally shorter than eye.
- A. Filamentous dorsal ray much longer than head; dorsal 4 or 5 + 52–62; 155 or more scales in lateral line.
1. About 155 to 180 scales in lateral line, about 13 to 16 between first dorsal fin and lateral line; caudal peduncle  $3\frac{1}{4}$  to 4 times as long as deep.
    - a. Dorsal 4 (5) + 52, anal 46–48; scales 155–160/13 or 14 ... *lepidion*.
    - b. Dorsal 4 + 56–62; anal 49–54; scales 180/15 or 16 ... *eques*.
  2. About 220 to 250 scales in lateral line, about 18 to 20 between first dorsal fin and lateral line; caudal peduncle  $1\frac{1}{3}$  to nearly 3 times as long as deep.
    - a. Last ray of second dorsal nearly above that of anal; eye  $3\frac{3}{4}$ , pectoral  $1\frac{5}{8}$  in head; dorsal 5 + 60, anal 52 ... *inosimae*.
    - b. Last ray of second dorsal posterior to that of anal; eye  $2\frac{3}{4}$  to  $3\frac{1}{2}$ , pectoral  $1\frac{2}{3}$  to  $1\frac{3}{4}$  in head; dorsal 5 + 52–56, anal 46–50.
      - α. Caudal peduncle  $1\frac{1}{3}$  to twice as long as deep; filamentous dorsal ray not broad and compressed ... *capensis*.
      - β. Caudal peduncle  $2\frac{2}{3}$  to nearly 3 times as long as deep; filamentous dorsal ray broad and compressed ... *ensiferus*.
- B. Filamentous dorsal ray much shorter than head; about 140 scales in lateral line; dorsal 5 + 50; caudal peduncle about  $2\frac{1}{2}$  times as long as deep ... *modestus*.

**Lepidion guentheri** (Giglioli).

*Haloporphyrus lepidion* (non Risso), Johnson, 1862, *Ann. Mag. Nat. Hist.* (3) x, p. 166; Günther, 1862, *Cat. Fish.*, iv, p. 358.

*Haloporphyrus guentheri*, Giglioli, 1880, *Nature*, xxi, p. 202; Vinciguerra, 1883, *Ann. Mus. Civ. stor. nat. Genova*, xviii, p. 558; Günther, 1887, *Deep-Sea Fish. 'Challenger'*, p. 90, pl. xviii, fig. A; Carus, 1889–93, *Prodr. Faun. Medit.*, ii, p. 576.

*Lepidion guentheri*, Goode and Bean, 1895, *Ocean. Ichth.*, p. 370.

*Hab.* Mediterranean and adjacent parts of the Atlantic.

In the British Museum 2 specimens, 500 and 610 mm. in total length.

**Lepidion oidema** (Tanaka).

*Haloporphyrus oidema*, Tanaka, 1927, *Fig. Descr. Fish. Japan*, xli, p. 796, pl. clxxi, fig. 472.

*Hab.* Deep water off Misaki, Sagami Prov., Japan.

The type was 345 mm. long. This species may prove to be identical with the preceding one.

<sup>1</sup> *Microlepidium*, Garman, is distinguished by the longer lower jaw, higher number of rays in the first dorsal fin, absence of filamentous dorsal ray, much larger number of pyloric appendages, etc. There are two species: *M. verecundum* (Gilbert) and *M. grandiceps*, Garman.

*Lepidion natalensis*, Gilchrist.

*Lepidion natalensis*, Gilchrist, 1922, *Rep. Fish. Mar. Biol. Surv. S. Afric.*, 11 (1921), Spec. Rep. III, p. 62; Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 324.

Depth of body about  $5\frac{1}{3}$  in the length, length of head nearly 4. Snout  $1\frac{1}{2}$  times as long as eye, diameter of which is 5 in length of head and about equal to interorbital width. Maxillary extending to a little beyond middle of eye; barbel very slightly longer than eye. 9 gill-rakers on lower part of anterior arch. Dorsal  $5 + 58$ ; <sup>1</sup>filamentous ray  $1\frac{2}{3}$  times as long as head. Anal 55. Pectoral about  $1\frac{1}{2}$  in length of head. Pelvic 7-rayed; not reaching vent, longest ray  $\frac{5}{6}$  length of head. About 20 pyloric caeca.

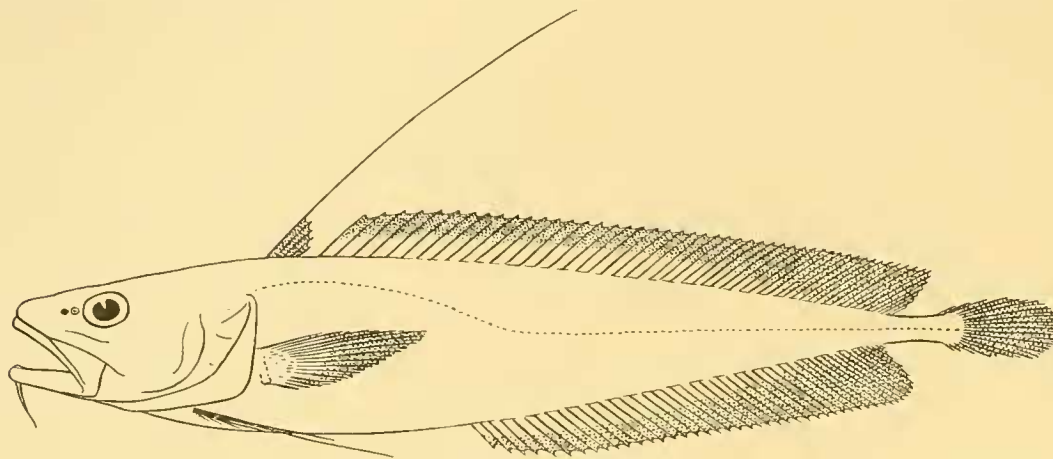


Fig. 15. *Lepidion natalensis*.  $\times \frac{1}{3}$ .

Pinkish grey; dorsal and anal fins with deep black margins, the black area becoming broader behind and covering the greater part of the posterior parts of the fins; caudal blackish; pectorals and pelvics dusky.

*Hab.* Coasts of south-east Africa.

In the British Museum a single specimen, 408 mm. in total length.

*Lepidion lepidion* (Risso).

*Gadus lepidion*, Risso, 1810, *Ich. Nice*, p. 118.

*Lotta lepidion*, Risso, 1826, *H.N. Europe*, III, p. 218.

*Lepidion rissoi*, Swainson, 1838, *N.H. Fishes etc.*, 1, p. 319.

*Lepidion rubescens*, Swainson, 1839, *N.H. Fishes etc.*, 11, p. 300.

*Haloporphyrus lepidion*, Giglioli, 1880, *Nature*, XXI, p. 202; Vinciguerra, 1883, *Ann. Mus. Civ. stor. nat. Genova*, XVIII, p. 554, pl. iii; Günther, 1887, *Deep-Sea Fish. 'Challenger'*, p. 91; Carus, 1889-93, *Prodr. Faun. Medit.*, 11, p. 576; Goode and Bean, 1895, *Ocean. Ichth.*, p. 370, fig. 323.

*Hab.* Western Mediterranean.

In the British Museum a single specimen, 253 mm. in total length, from Nice.

*Lepidion eques* (Günther).

*Haloporphyrus eques*, Günther, 1887, *t.c.*, p. 91, pl. xviii, fig. B; Holt and Calderwood, 1895, *Sci. Trans. R. Dublin Soc.*, v (11), p. 446, pl. xxxix, figs. 1, 2; Koehler, 1896, *Ann. Univ. Lyon*, XXVI, p. 487; Lütken, 1898, *Danish Ingolf Exped.*, 11, 1. *Ichth. Res.*, p. 30, pl. iv, fig. 7.

<sup>1</sup> Gilchrist gives 8 rays in the first dorsal, but this is probably an error.

*Lepidion eques*, Goode and Bean, 1895, *Ocean. Ichth.*, p. 371; Collett, 1905, *Rep. Norweg. Fish. Mar.-Invest.*, 11 (3), p. 69; Koefoed, 1926, *Rep. Sci. Res. 'Michael Sars' N. Atlant. Exped.* 1910, IV (1), *Zool.*, p. 124, fig. 50.

*Haloporphyrus lepidion* var. *eques*, Roule, 1919, *Rés. Camp. Sci. Monaco*, LII, p. 78.

*Hab.* Eastern Atlantic.

In the British Museum several specimens, up to 350 mm. in total length, including the types of the species.

Very closely related to, or perhaps identical with *L. lepidion*.

***Lepidion inosimae* (Günther).**

*Haloporphyrus inosimae*, Günther, 1887, *t.c.*, p. 92, pl. xx, fig. B.

*Hab.* Inosima, Japan.

In the British Museum 4 specimens, 212–305 mm. in total length—types of the species.

***Lepidion capensis*, Gilchrist.**

*Lepidion capensis*, Gilchrist, 1922, *Rep. Fish. Mar. Biol. Surv. S. Afric.*, 11 (1921), Spec. Rep. 111, p. 61; Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 324, pl. xiii, fig. 1.

*Hab.* South Africa.

In the British Museum 7 specimens, 310–500 mm. in total length.

***Lepidion ensiferus* (Günther).**

*Haloporphyrus ensiferus*, Günther, 1887, *t.c.*, p. 92, pl. xix, fig. A.

*Hab.* Off the mouth of the Rio Plata.

In the British Museum 4 specimens, 265–350 mm. in total length—types of the species.

***Lepidion modestus* (Franz).**

*Haloporphyrus modestus*, Franz, 1910, *Abh. K. Bayer. Akad. Wiss. Münch.*, Suppl. IV, Abh. 1, p. 28, pl. iv, fig. 13.

*Hab.* Yokohama, Japan.

Only the type known, 340 mm. in total length.

## TRACHICHTHYIDAE

***Hoplostethus mediterraneus*, Cuv. and Val.**

Barnard, 1925, *Ann. S. Afr. Mus.*, XXI, p. 362.

St. J. 1 specimen, 165 mm.

***Hoplostethus atlanticus*, Collett.**

Collett, 1889, *Bull. Soc. zool. Fr.*, XIV, p. 306; Goode and Bean, 1895, *Ocean. Ichth.*, p. 189.

St. J. 9 specimens, 210–430 mm.

This species is readily distinguished from the preceding by the relatively smaller eye, smaller scales, indistinct abdominal scutes, higher number of dorsal rays, etc. It was not included by Barnard in his South African monograph.



## ZEIDAE

**Zeus capensis**, Cuv. and Val.

Barnard, 1925, *Ann. S. Afr. Mus.*, xxi, p. 373, pl. xvi, fig. 3.  
St. A. 2 specimens, 190, 210 mm.

**Pseudocyttus maculatus**, Gilchrist.

Barnard, *t.c.*, p. 376.  
St. J. 7 specimens, 210-445 mm.

**Neocyttus rhomboidalis**, Gilchrist.

Barnard, *t.c.*, p. 377.  
St. J. 3 specimens, 100-105 mm.

**Allocyttus verrucosus** Gilchrist.

Barnard, *t.c.*, p. 378, pl. xvi, fig. 4.  
St. J. 19 specimens, 100-395 mm.

## CARANGIDAE

**Trachurus trachurus** (Linn.).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 531, pl. xxiii, fig. 1.  
1 specimen, 380 mm., presented by Messrs Irvine and Johnstone.

## BRAMIDAE

**Brama raii** (Bloch.).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 594, pl. xxiv, fig. 3.  
St. D. 1 specimen, 520 mm.  
St. G. 2 specimens, 500, 570 mm.  
St. ?. 1 specimen, 610 mm.

## SCIAENIDAE

**Umbrina capensis**, Pappe.

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 578, pl. xxiii, fig. 4.  
1 specimen, 360 mm., presented by Messrs Irvine and Johnstone.

## SPARIDAE

**Dentex rupestris**, Cuv. and Val.

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 714.  
St. 90. 11. vii. 26. Large gauze fish-trap, 10 m.: 1 specimen, 68 mm.

**Dentex argyrozona**, Cuv. and Val.

Barnard, *t.c.*, p. 717.  
1 specimen, 340 mm., presented by Messrs Irvine and Johnstone.

**Pachymetopon blochi** (Cuv. and Val.).

Norman, 1935, *Ann. S. Afr. Mus.*, xxxii, p. 12, fig. 3.  
St. 90. 11-12. vii. 26. Hand line and large gauze fish-trap, 10 m.: 2 specimens, 85, 200 mm.

**Sparus globiceps** (Cuv. and Val.).

Barnard, *t.c.*, p. 685.

1 specimen, 350 mm., presented by Messrs Irvine and Johnstone.

**Diplodus rondeleti** (Cuv. and Val.), var. **capensis**, Smith.

Barnard, *t.c.*, p. 691.

St. 90. 10. vii. 26. Hand line, 10 m.: 1 specimen, 300 mm.

**Pagrus laniarius**, Cuv. and Val.

Barnard, *t.c.*, p. 694, fig. 24.

1 specimen, 390 mm., presented by Messrs Irvine and Johnstone.

## CLINIDAE

**Clinus taurus**, Gilchrist and Thompson.

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 858.

29. vi. 27. Simon's Town. 1 specimen, 122 mm.

Found while draining the dry dock.

## BROTULIDAE

**Bidenichthys capensis**, Barnard.

1934, *Ann. Mag. Nat. Hist.* (10) xiii, p. 234, fig. 3.

St. 90. 11. vii. 26. Hand net, 1-2 m.: 1 specimen, 45 mm.

This interesting little fish is new to the British Museum collection.

## OPHIDIIDAE

**Genypterus capensis** (Smith).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 887, pl. xxxv, fig. 5.

St. D. 4 specimens, 440-475 mm.

St. P. 3 specimens, 700-770 mm.

This species is closely related to the Australian and New Zealand *G. blacodes* (Schn.), but may be recognized by the smaller eye.

## SCORPAENIDAE

**Helicolenus maculatus** (Cuv. and Val.).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 907.

St. C. 4 specimens, 304-360 mm.

St. ?. 1 specimen, 350 mm.

**Scorpaena** (??) **capensis**, Gilchrist and von Bonde.<sup>1</sup>

*Sebastosemus capensis*, Barnard, *t.c.*, p. 910.

St. J. 2 specimens, 370, 400 mm.

<sup>1</sup> See note on p. 32 of this report.

## TRIGLIDAE

*Chelidonichthys capensis* (Cuv. and Val.).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 940, pl. xxxiv, fig. 3, fig. 28 c.

St. A. 2 specimens, 405, 435 mm.

## COTTUNCULIDAE

*Cottunculoides inermis* (Vaillant).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 923, pl. xxxiv, fig. 1.

St. J. 1 specimen, 267 mm.

## TETRODONTIDAE

*Tetrodon honckeni*, Bloch.

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 970, pl. xxxvi, fig. 6.

12. vii. 27. Simon's Town Dockyard. 2 specimens, 160, 195 mm.

## LOPHIIDAE

*Lophius piscatorius*, Linn.

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 999.

St. A. 1 specimen, 380 mm.

St. B. 1 specimen, 150 mm.

## ASCENSION ISLAND

28 specimens were collected at this locality, representing 12 species.

## SERRANIDAE

*Paranthias furcifer* (Cuv. and Val.).

St. 1. 16. xi. 25. Medium rectangular net, 16-27 m.: 1 specimen, 72 mm.

## CARANGIDAE

*Trachurops crumenophthalmus* (Bloch).

St. 2. 17. xi. 25. Shore collection—rock pools: 2 specimens, 200, 225 mm.

## POMACENTRIDAE

*Glyphisodon saxatilis* (Linn.).

St. 2. 17. xi. 25. Shore collection—rock pools: 7 specimens, 22-165 mm.

*Pomacentrus leucostictus*, Müll. and Trosch.

St. 1. 16. xi. 25. Medium rectangular net, 16-27 m.: 2 specimens, 60, 69 mm.

## LABRIDAE

*Thalassoma ascensionis* (Quoy and Gaim.).

St. 2. 17. xi. 25. Shore collection—rock pools: 1 specimen, 105 mm.



## BLENNIIDAE

*Rupiscartes atlanticus* (Cuv. and Val.).

St. 2. 17. xi. 25. Shore collection—rock pools: 1 specimen, 140 mm.

*Salariichthys textilis* (Quoy and Gaim.).

St. 2. 17. xi. 25. Shore collection—rock pools: 6 specimens, 23–60 mm.

## MUGILIDAE

*Myxus* (?) *curvidens* (Cuv. and Val.).

St. 2. 17. xi. 25. Shore collection—rock pools: 2 specimens, 47, 100 mm.

## SCORPAENIDAE

*Scorpaena scrofina*, Cuv. and Val.

St. 1. 16. xi. 25. Medium rectangular net, 16–27 m.: 2 specimens, 44, 48 mm.

## BALISTIDAE

*Balistes vetula*, Linn.

St. 1. 16. xi. 25. Medium rectangular net, 16–27 m.: 1 specimen, 70 mm.

*Melichthys piceus* (Poey).

St. 2. 17. xi. 25. Shore collection—rock pools: 1 specimen, 175 mm.

## ANTENNARIIDAE

*Antennarius multiocellatus* (Cuv. and Val.).

St. 1. 16. xi. 25. Medium rectangular net, 16–27 m.: 1 specimen, 9 mm.

Another specimen, 70 mm. long, was presented by Mr L. W. Shaw.

In comparison with the fishes of St Helena, which have been dealt with by Günther, Melliss, Cunningham, and Clark,<sup>1</sup> among others, those of Ascension have been somewhat neglected. The island was visited by Osbeck,<sup>2</sup> who listed 9 species, several afterwards utilized by Linnaeus. More than a hundred years later the 'Challenger' made a small collection here, which was reported upon by Günther,<sup>3</sup> who also recorded 3 further species in the following year.<sup>4</sup> Nichols and Murphy<sup>5</sup> published a note on *Balistes vetula* from Ascension, and, finally, in 1919 Fowler<sup>6</sup> recorded about a dozen species, and also described a new species of *Abudefduf* (= *Glyphisodon*), which may also occur at St Helena.

<sup>1</sup> For references to these papers see, Fowler, 1919, *Proc. U.S. Nat. Mus.*, LVI, p. 217.

<sup>2</sup> 1765, *Reise Ost.-Ind. China*, pp. 385–96.

<sup>3</sup> 1880, *Shore Fish. 'Challenger'*, p. 5.

<sup>4</sup> 1881, *Ann. Mag. Nat. Hist.* (5) VIII, pp. 430–40.

<sup>5</sup> 1917, *Copeia*, No. 39, p. 2.

<sup>6</sup> *T.c.*, pp. 217–27.

Species	St Helena	West Indies	Brazil	West Africa <sup>1</sup>	South Africa	
<i>Carcharinus obscurus</i> (Le Sueur)	.	×	×	×	×	Atlantic
<i>Lycodontis moringa</i> (Cuv.)	×	×	×	.	.	
<i>Tylosurus caribbaeus</i> (Le Sueur)	.	×	.	.	.	
<i>Belone ardeola</i> , Cuv. & Val.	×	×	.	×	.	
<i>Exocoetus bahiensis</i> , Ranzani	.	×	×	×	×	Atlantic
<i>Aulostomus maculatus</i> , Val.	×	×	×	.	.	
<i>Myripristis jacobus</i> , Cuv. & Val.	×	×	×	.	.	
<i>Holocentrum adscensionis</i> (Osbeck)	×	×	×	×	.	
<i>Epinephelus aeneus</i> (Geoffr.)	.	.	.	×	.	Mediterranean
<i>Epinephelus adscensionis</i> (Osbeck)	×	×	×	×	×	
<i>Paranthias furcifer</i> (Cuv. & Val.)	.	×	×	.	.	Pacific coast, trop. America
<i>Rypticus saponaceus</i> (Schn.)	×	×	×	×	×	
<i>Priacanthus cruentatus</i> (Lacep.)	×	×	.	×	×	Pacific
<i>Apogon axillaris</i> , Val.	×	.	.	.	.	
<i>Malacanthus plumieri</i> (Bloch)	.	×	×	.	.	
<i>Decapterus sanctae helenae</i> (Cuv. & Val.)	×	×	×	×	.	
<i>Caranx lugubris</i> , Poey	×	×	×	.	×	Atlantic and Pacific
<i>Caranx hippos</i> (Linn.)	×	×	×	×	×	Atlantic and Pacific
<i>Trachurops crumenophthalmus</i> (Bloch)	.	×	×	×	.	Atlantic and Pacific
<i>Trachinotus glaucus</i> (Linn.)	×	.	×	×	×	Mediterranean
<i>Upeneus martinicus</i> , Cuv. & Val.	.	×	×	.	.	
<i>Diplodus argenteus</i> (Cuv. & Val.)	.	×	×	.	.	
<i>Chaetodon sanctae-helenae</i> , Günth.	×	.	.	.	.	
<i>Pomacanthus paru</i> (Bloch)	.	×	×	.	.	
<i>Glyphisodon saxatilis</i> (Linn.)	×	×	×	×	.	Pacific coast, trop. America
<i>Glyphisodon ascensionis</i> (Fowler)	×	.	.	.	.	
<i>Chromis marginatus</i> (Cast.)	×	.	×	.	.	
<i>Pomacentrus leucostictus</i> , Müll. & Tr.	×	×	×	×	.	
<i>Thalassoma ascensionis</i> (Quoy & Gaim.)	×	.	.	.	.	
<i>Harpe rufa</i> (Linn.)	×	×	×	.	.	
<i>Pseudoscarus guacamaia</i> (Cuv.)	.	×	×	×	.	
<i>Teuthis hepatus</i> (Linn.)	×	×	×	×	.	
<i>Blennius cristatus</i> , Linn.	.	×	×	×	×	
<i>Rupiscartes atlanticus</i> (Cuv. & Val.)	×	×	×	×	.	Pacific coast, trop. America
<i>Alticus textilis</i> (Cuv. & Val.)	×	×	×	.	.	
<i>Ophioblennius webbi</i> (Val.)	.	×	×	×	.	
<i>Mugil cephalus</i> , Linn.	.	×	×	×	×	Mediterranean; Pacific coast of America
<i>Myxus curvidens</i> (Cuv. & Val.)	.	.	×	×	.	
<i>Echeneis naucrates</i> , Linn.	×	×	×	×	×	All warm seas
<i>Scorpaena plumieri</i> , Bloch	.	×	×	.	.	
<i>Scorpaena scrofina</i> , Cuv. & Val.	×	.	.	.	.	
<i>Dactylopterus volitans</i> (Linn.)	.	×	×	×	×	Atlantic
<i>Bothus mellissi</i> , Norman	×	.	.	.	.	
<i>Alutera scripta</i> (Osbeck)	.	×	×	×	.	Pacific (?)
<i>Canthidermis maculatus</i> (Bloch)	.	×	×	.	×	Pacific (?)
<i>Balistes vetula</i> , Linn.	.	×	×	.	×	
<i>Melichthys piceus</i> (Poey)	×	×	×	.	.	
<i>Lactophrys tricornis</i> (Linn.)	×	×	×	×	.	
<i>Antennarius multiocellatus</i> (Cuv. & Val.)	.	×	×	.	.	

<sup>1</sup> Including Madeira, Canaries, Cape Verde Islands, etc.

In addition to the earlier collections made by H.M.S. 'Challenger' (1873-76), Mr T. Conry (1881), and Dr A. McCloy (1908), the British Museum has received two larger and valuable lots from Ascension in recent years, one presented in 1927 by Dr J. J. Simpson of the Liverpool Public Museum, the other presented in 1932 by Colonel S. T. Haley. With this material available, it seems desirable to draw up a provisional list of the fishes recorded from the island, and to indicate in the form of a table the distribution of the various species. A glance at this table shows at once that the fauna, like that of St Helena, is predominantly West Indian and Brazilian in character. Of the 49 species recorded, 27 or 28 occur also at St Helena, and doubtless others will be found to be common to the two islands. A certain number of the species also appear to occur on the coast of West Africa, but many of the records from this region are unreliable.

### TRISTAN DA CUNHA

Examples of 3 species were obtained here, including a fine specimen of a new species of *Decapterus*, which has been described and figured by me elsewhere.

### CARANGIDAE

*Decapterus longimanus*, Norman.

1935, *Ann. Mag. Nat. Hist.* (10) xvi, p. 255, fig. 1.

St. 4. 30-31. i. 26. Hand line, 40 m.: 1 specimen (holotype), 470 mm.

### CHILODACTYLIDAE

*Acantholatris monodactylus* (Carmichael).

*Chaetodon monodactylus*, Carmichael, 1818, *Trans. Linn. Soc.*, xi, p. 500, pl. xxiv.

*Chilodactylus carmichaelis*, Cuvier and Valenciennes, 1830, *Hist. Nat. Poiss.*, v, p. 360; Kner, 1869, *Reise 'Novara'*, Zool. 1, 5. *Fische*, p. 90, pl. v, fig. 1.

*Chilodactylus monodactylus*, Regan, 1913, *Ann. Mag. Nat. Hist.* (8) xi, p. 466.

This species was redescribed and figured by Kner from St Paul Island, in the same latitude as Tristan da Cunha but 4500 miles distant. There are in the British Museum collection two small specimens from Tristan da Cunha presented by the South African Museum, and another larger one from the same locality collected by the Shackelton-Rowett Expedition ('Quest'). This species is quite distinct from the Chilean *Acantholatris gayi* (Kner), of which the 'Challenger' obtained two fine examples from Juan Fernandez.<sup>1</sup>

### SCORPAENIDAE

*Sebastichthys capensis* (Gmelin).

Barnard, 1927, *Ann. S. Afr. Mus.*, xxi, p. 908.

St. 4. 30-31. i. 26. Hand line, 40 m.: 1 specimen, 340 mm.

Also obtained from Gough Island ('Scotia' and 'Quest').

<sup>1</sup> The Chilean form is well described by Cuvier and Valenciennes (1833, *H.N. Poiss.*, ix, p. 489) as *Cheilodactylus carmichaelis*, and it was subsequently figured by Valenciennes (1850, in Cuvier, *R. Anim.*, Discip. Ed., *Poiss.* pl. xxxi, fig. 2).



## GOUGH ISLAND

Examples of only 2 species were obtained from this locality.

## CHILODACTYLIDAE

*Acantholatris monodactylus* (Carmichael).

St. WS 123. 8. vi. 27. Hand line, 47-72 m.: 1 specimen (head only), 110 mm.

## BOVICHTHYIDAE

*Bovichtus diacanthus* (Carmichael).

*Callionymus diacanthus*, Carmichael, 1818, *Trans. Linn. Soc.*, xii, p. 501, pl. xxvi.

*Bovichthys diacanthus*, Günther, 1860, *Cat. Fish.*, ii, p. 249; Regan, 1913, *Ann. Mag. Nat. Hist.*, (8) xi, p. 467; Regan, 1913, *Trans. R. Soc. Edinb.*, xlix, pp. 239, 256, pl. ix, fig. 5.

St. WS 123. 9. vi. 27. Shore collection: 3 specimens, 200-245 mm.

Originally described from Tristan da Cunha, this species was taken by the 'Scotia' at Gough Island. Regan has shown that it is distinct from the Chilean form, *B. chilensis*, Regan. It is represented at the Island of St Paul by a closely related species, *B. veneris*, Sauvage.

## APPENDIX

A certain number of flying fishes were obtained by the Expedition, and the specimens are being studied by Dr Anton F. Bruun of the Marinbiologisk Laboratorium, Copenhagen, who has undertaken a general revision of the Exocoetidae of the Atlantic. He has kindly furnished me with the following identifications of specimens from areas covered by the present report.

## EXOCOETIDAE

*Oxyporhamphus micropterus* (Cuv. and Val.).

St. 289. 23. viii. 27. 3° 04' 45" N, 16° 52' W. Hand net: 2 specimens, 182, 189 mm.

St. 294. 25. viii. 27. 4° 33' 15" N, 16° 52' 45" W. Hand net: 1 specimen, ca. 163 mm.

*Exocoetus volitans*, Linn.

11. xi. 25. 1° 04' S, 12° 50' W. Flew on board: 1 specimen, 204 mm.

17. iv. 33. 3° 21' S, 8° 37' W. On deck: 1 specimen, ca. 176 mm.

*Exocoetus obtusirostris*, Günth.

26. x. 25. 16° 19' N, 18° 24' W. Flew on board: 1 specimen, ca. 176 mm.

25. x. 25. 17° 30' N, 18° 16' W. Flew on board: 1 specimen, 212 mm.

*Cypsilurus cyanopterus* (Cuv. and Val.).

6. v. 32. 19° 06' S, 38° 39' W. On deck: 1 specimen, ca. 167 mm.

*Cypsilurus lineatus* (Cuv. and Val.).

24. x. 25. 21° 00' N, 18° 05' W. Flew on board: 1 specimen, ca. 427 mm.